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ON

RADIOLOGY FROM A SURGEON'S STANDPOINT.

Delivered before the Institute of Radiology

BY W. SAMPSON HANDLEY, M.S. LOND., F.R.C.S. ENG.,

SENIOR SURGEON TO THE MIDDLESEX HOSPITAL.

FOR the privileged position I occupy on this occasion I can at least claim one qualification—namely, that the span of my professional life coincides almost to a year with the history of radiology so far as it has yet been written. In 1896 the present Sir Frederick Hopkins, then on the teaching staff of Guy's Hospital, as an enthusiastic amateur of the new science, had acquired a primitive X ray set. At his request and in my capacity of house surgeon I collected a group of five cases supposed with varying degrees of probability to have needles embedded in their hands. As the screen had no dark camera attached it was necessary to turn the gas very low, ignoring the offensive fumes which the Argand burner under such conditions produces. Moreover, the insulation of high tension wires was at that date absent or imperfect. The demonstration was successful; an embedded needle was clearly seen in every case, and was marked upon the skin. In other words, five cases, previously undiagnosable, were diagnosed by the new method. The patients were told to come up for operation next day, but not a single one returned to the scene of the diabolical séance at which he had assisted, where in a dark and evil-smelling chamber there had appeared before him a mysterious green globe of light, the operation of which was attended by painful electric shocks and by the awful vision of his own skeleton.

It seems difficult to believe that the distance separating this primitive phase from the radiography of the present day with its instantaneous deep pictures, and its powers of recording the phases of moving viscera such as the stomach and the heart, can have been traversed in the short space of 35 years. I note in passing that the first motion pictures of the heart and limbs were produced in this country by Dr. Russell Reynolds.

The progress made would have been impossible without the coöperation of the physicists, among whom the first President of the Rontgen Society, after whom the present lecture is named, must ever hold an honoured place. To-day the physicist is pre-eminent as the authentic medicine-man of the tribe. His achievements paralyse our powers of wonder, otherwise they would become intolerable. Moving confidently about in a universe totally inappreciable to any of his senses, at one moment burrowing in the interior of an atom, at another creating vast, and some think unnecessary, disturbances in the all-pervading ether, he has asserted his mastery and proved his incredible statements by making the electron the humble servant, messenger, musician, artist, and plaything of man. It is becoming clear that in some respects the imaginative faculties of a poet compared to the disciplined imagination of a great scientist are as a child's first lispings compared to the rational utterance of a grown man.

A special word of recognition is due to that very small band of physicists who have forsaken the cold joys of pure intellection to serve sick humanity. I may be allowed to recall with satisfaction that the Middlesex Hospital, which I have the honour to serve, was the first hospital to appoint a physicist upon its staff in the person of Prof. Sidney Russ, and St. Bartholomew's Hospital in the appointment of Prof. F. L. Hopwood has followed this sound example. To the pioneers of medical radiology who plunged into the unknown territory determined to fathom its secrets at any cost, sufficient honour can never be paid. Many of them continued their work long after they knew the inevitable penalty of doing so. And on this occasion, with a sense of loss which the lapse of time fails to dull, I recall the memory of my friend Cecil Lyster. During the past year radiology has suffered a heavy loss in the death of Dr. Robert Knox. He was wise in council with that mixture of enterprise and caution which is the mark of his countrymen, skilful with his pen, cautious in his judgments, systematic and original in his method of work. In the judgment of the world outside, as well as in that of Britain, he was at the time of his death one of the foremost radiologists.

THERAPEUTIC RADIOLOGY.

Time will not allow me to recount the advances of diagnostic radiology which in recent years have made the thorax and the skull as transparent as the limbs. It may still be doubted whether some medical practitioners make use of diagnostic radiology to the full extent demanded by the interests of their patients. But the advance made can be measured by one simple fact. The doctor nowadays who treats a fracture or a severe sprain without insisting upon a radiograph places himself out of court.

Recent years have seen a striking enlargement of the field of therapeutic radiology, and I cannot attempt a systematic survey of the progress made. Confining myself to diseases which come under the surgeon's eye I have first to consider certain non-malignant but precancerous conditions.

Chronic Mastitis.

Chronic mastitis is of special interest to me because I believe I was the first to advocate its treatment by X rays in a paper on the prophylaxis of breast cancer contributed to the *Practitioner* in April, 1910. It may be said to-day that X rays have fully established their position as the most effective therapeutic agent for chronic mastitis. In support of this opinion I could call in the authority of a number of well-known radiologists, with whom I have been associated in the treatment of cases, and especially of Dr. G. B. Batten, Dr. Russell Reynolds, Dr. Douglas Webster, and Dr. Stanley Melville. A long course of treatment is not as a rule required. Not only do X rays relieve pain, but the mastitic swellings frequently disappear entirely and the breast returns to the normal. Radiation is, however, comparatively ineffective in the cystic form of the disease, and for this when it occurs in middle age operation is still often necessary. X rays may aggravate subacute mastitis and must be used with great caution in this condition. In acute mastitis they are contra-indicated. Among the large number of cases of chronic mastitis which I have sent for X ray treatment there are three who developed cancer in the breast during or after the treatment. But for some years past no such case has occurred, a token, I think, of the increased efficiency of X ray treatment.

Chronic mastitis, or duct catarrh of the larger ducts which is closely allied to it, is a frequent precursor of cancer of the breast, and significantly affects by choice the same quadrant of the breast, the upper and outer one. In duct catarrh of the breast certain of the main ducts are choked by masses of shed epithelium, the product of the undue activity of their lining membrane. The ducts near the nipple are palpable as tortuous cords. Around the affected ducts there is newly formed fibrous tissue associated with areas of round-celled infiltration. The contraction of this fibrous tissue produces four clinical danger signals—namely, (1) axial deviation of the nipple; (2) retraction of the orifices upon the nipple of one or more of the affected ducts; (3) slight elevation of the nipple; (4) perhaps slight flattening of the nipple. When these signs appear, even though there may be no lump in the breast, the imminent onset of a cancer

should be feared. The appearance of white dots upon the nipple is significant. These dots are the ends of the cylinders of epithelial debris which fill the affected ducts, and may sometimes be squeezed out of them by digital pressure.

I am very hopeful that in cases where the danger signals I have mentioned are present the timely administration of a course of X rays of some penetrative power will avert the development of cancer. I saw recently a case in which three years previously I removed the right breast for a precancerous mastitis. The remaining breast now shows danger signals, though no tumour is present. I am sending her for X ray treatment and hope thus to avert the threatened onset of a carcinoma. I believe there is a large and hopeful field for the employment of X rays as a preventive of breast cancer in women with a family history of the disease, and in those presenting signs of chronic mastitis or duct catarrh.

Papillomata.

In duct papilloma of the breast I am unable to record success from X ray treatment. If, however, the papilloma can be localised removal of the breast can often be averted by the use of buried radium tubes. Multiple papilloma of the colon usually ends in carcinoma and no effective treatment is known. Is it not possible that it might be successfully attacked by X rays or by the swallowing of radon capsules?

THREE PERIODS OF X RAY THERAPY.

Looking back over the history of therapeutic X rays during the past 30 years three periods can be traced.

The *first period* of inadequate and tentative dosage, sometimes successful in destroying a primary growth, but rarely averting dissemination. X ray treatment of this first period in my opinion established its value as a prophylactic of recurrence, but to a limited extent only. In alliance with improved methods of operation it almost abolished local recurrence after breast operations, but it showed itself powerless to prevent the deeper parasternal deposits arising from the glands of the internal mammary chain. I have lately shown that in a large percentage of cases of breast cancer these glands are infected prior to operation.

The *second period* of X ray therapy was ushered in by the discovery of the Coolidge tube and the exploitation at Erlangen of the utmost power the tube could supply or the patient withstand. The high hopes which the method inspired have been shattered, and the words of caution uttered by leading British radiologists, and especially by Knox, have been fully justified. On at least three occasions I have seen fresh secondary nodules appear on an area which had been subjected within the previous three months to intensive X ray treatment. In the following case intensive X ray treatment seemed clearly to have stimulated a growth and perhaps to have aroused into activity a second primary growth.

Miss H. noticed a lump in the left breast in 1924. The breast was removed by her doctor. In January, 1928, an enlarged right axillary gland was felt. Intensive X ray therapy was begun and was continued for six months. The patient then ceased to attend, finding that her condition was getting worse. While she was under treatment the right breast became hard, and a rash appeared extensively over the chest. When I first saw her on July 31st, 1928, she had an ulcerated right nipple with a subjacent growth having the characters of a second primary growth. A recurrent lump was present just below the left axilla in the operation scar. An extensive nodular erythematous rash covered the front of the chest and extended into the left axilla. It had a definitely raised edge, and in the axilla its lower margin formed a right angle which appeared without any doubt to mark out the lower limit of an area of X ray exposure.

It is agreed by dermatologists that a right angle seen in a skin lesion marks it as "factitious" and this case comes under that rule.

The *third period* of X ray therapy dates from the recognition of the failure of Erlangen methods. The great power of the modern tube is now used in divided doses which do not produce vomiting or other undesirable constitutional symptoms. These methods are justifying themselves by a progressive increase in the power of X ray treatment to control and prevent recurrence. I note particularly that I have recently seen several cases where the advance of nodular deposits of breast cancer, widely spread over the chest and abdomen, has been arrested. Successes have also been recorded in the treatment of primary breast cancers by X rays alone, and I have myself seen such cases. But even after the disappearance of the primary growth the appearance of secondary foci may falsify the hopes first raised.

RADIUM.

The discovery of radium by the Curies, a characteristic triumph of French logic and perseverance, opened out new vistas in radiology. Radium rays proved themselves to be much more effective in quality than the X rays available at that time, and to a certain extent I believe this is still true. But the principal advance was this, that it became possible for the first time to introduce the focus of radiation within the body and thus to maximise the dose of radiation received by the diseased area and to minimise the dose received by the rest of the body. To secure this characteristic advantage of radium to the full a new branch of surgery has arisen which has received the name of radio-surgery, and except in growths on the surface the use of buried radium tubes, first introduced by Dominici, seems likely to supersede surface radium treatment.

Radio-Surgery.

In regard to radio-surgery the most interesting question of the moment is the proper therapeutic adjustment of two variables, the amount of radium buried, and the time it is left in. Shall a high intensity of radium radiation be used for a short time, say 24 hours, or a low intensity for a long time, say a week? At the Middlesex Hospital, partly because of the operation of a rota for the use of radium by different members of the staff, the large quantity short time method has been in use. In some forms of growth—for instance, in bone sarcomas and in the sternal deposits of breast cancer—it has given excellent results. In growths of the tongue Prof. C. Regaud's observations in Paris show that the prolonged low-intensity method is much the more effective.

The results obtained in cancer of the tongue at Westminster Hospital by Mr. Arthur Evans and others with even smaller amounts of radium are, I understand, very good. At St. Bartholomew's Hospital Mr. Geoffrey Keynes has used a prolonged low-intensity method as a substitute for operation in breast cancer, and with promising results. He has shown that it is possible, using only a moderate amount of radium, to deal effectively with a large area of tissue. Thus the prolonged low-intensity method, as compared with the short high-intensity method, would seem to have definitely proved its superiority in squamous carcinoma and in some glandular cancers. Sir C. Gordon Watson has made a systematic attempt to apply the prolonged low-intensity method to rectal cancer.

And here I must confess that at the Middlesex Hospital we have been in this respect slow to draw practical conclusions from the results of our own research laboratories. The time-quantity ratio for any given number of milligramme-hours was first shown to be of importance in treatment by Prof. Lazarus Barlow, and I believe that his results inspired to some extent the methods which Regaud has successfully adopted for cancer of the tongue at the Radium Institute in Paris. It was shown by Lazarus Barlow that cells in a state of active division are about seven times more sensitive to radiation than resting cells. The necessity of prolonging the radiation period so as to cover, if possible, the division of every cell of a malignant mass is thus indicated, and is insisted upon by Regaud. Lazarus, Barlow also compared the effects of quantitatively identical gamma-ray

bombardment upon squamous and upon columnar epithelium, according as the quantity of radium was large and the time of exposure small, or the quantity of radium was small and the time of exposure large. For squamous epithelium the prolonged low-intensity treatment was the more effective. Clinical observations have confirmed these results for squamous carcinoma beyond the possibility of doubt.

Prophylactic Use of Radium.

It is now about seven years since I realised that the internal mammary glands which lie along the internal mammary artery just outside the edge of the sternum are infected by breast cancer at about the same time as the axillary glands. About seven cases out of ten have enlarged axillary glands when they first come for advice. Thus in 70 per cent. of cases, when it first comes into the surgeon's hands, breast cancer is an intrathoracic disease. Since I recognised this fact and met it by burying a line of radium tubes at the time of operation along the line of the internal mammary glands, the percentage of my cases free from recurrence at the end of three years has gone up from 47 to 56.

The Stimulating Effect of Small Doses.

I now approach a subject of great difficulty, and one which appears to require increased attention from radiologists. I refer to the possibility, which from my clinical experience appears almost a certainty, that very small doses of radiation may exert a stimulating effect upon the cells of a malignant growth, and may thus do harm instead of good. The suggestion is that if a radium tube is placed for a certain time in a field of tissue already impregnated with isolated and latent carcinoma cells, the field will differentiate itself into three zones: (1) a central circle or zone where carcinoma cells are destroyed; (2) an inner zone where the carcinoma cells, though not killed, are inhibited; (3) an outer zone where the carcinoma cells are stimulated to more rapid growth. Abbé, experimenting with bean embryos, found that a minimal dose of radium stimulated growth, while increasing doses progressively retarded and finally arrested the growth of the embryo. Lazarus Barlow, working with ascaris ova, obtained similar results. These observations establish a prima facie case for small dose stimulation of malignant cells by radiation, a phrase for which in the rest of this lecture I shall use for short the word "stimulation."

In my earlier work with buried radium tubes, now dating back nearly 15 years, it was my custom to implant the tubes in the centre of or beneath the palpable or visible nodule of malignant tissue. The usual result was the shrinkage or disappearance of the malignant focus. But within a few months the hopes thus raised were shattered by the appearance of fresh malignant nodules in the region immediately around. It seemed likely that this unsatisfactory result was due to the stimulation, by an inadequate dose of radiation, of an inappreciable and apparently healthy zone of microscopic invasion around the visible focus of disease. To meet this danger I adopted, and have since used, the plan of encircling the palpable focus of disease by a ring of radium tubes in order to sterilise the zone of microscopic infection.

In connexion with this question I now wish to draw attention to a case of recurrent breast cancer which presented two nodules close to each other, one above and one below the outer part of the scar (Fig. 1). On March 31st, 1928, a 25 mg. tube of radium bromide was buried just above the upper nodule and a similar tube just below the lower nodule for 24 hours. At this time these nodules were the only recurrent manifestations anywhere near the scar, but on April 8th a suspicion of nodular thickening was felt at a point four inches internal to the original nodules, and the same distance from the radium tubes. By May 2nd a line of definite nodules was present along the scar, the nearest nodule 2 in. from the focus of radiation, the furthest 4½ in. from it. The smallest nodules were the nearest one and the most remote one, the largest, was 4 in. from the focus. The nodules originally treated were reduced to fibrotic relics. A second tracing was made on May 18th. A new tiny nodule had now appeared 1 in. only from the focus. The other nodules had continued to grow, the original one being still the largest. By May 25th three new nodules had appeared, one of them 1¾ in. away from the focus, the other two 2½ in. away from it. Of the two remotest nodules, 4½ in. away, one had disappeared and the other was smaller.

If we assume that numerous quiescent depôts of cancer cells were present all along the scar at the

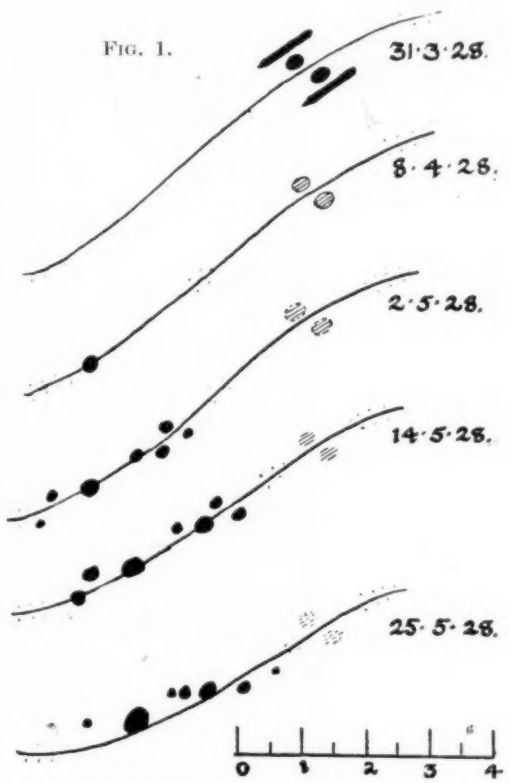


Diagram of operation scar and recurrent nodules.

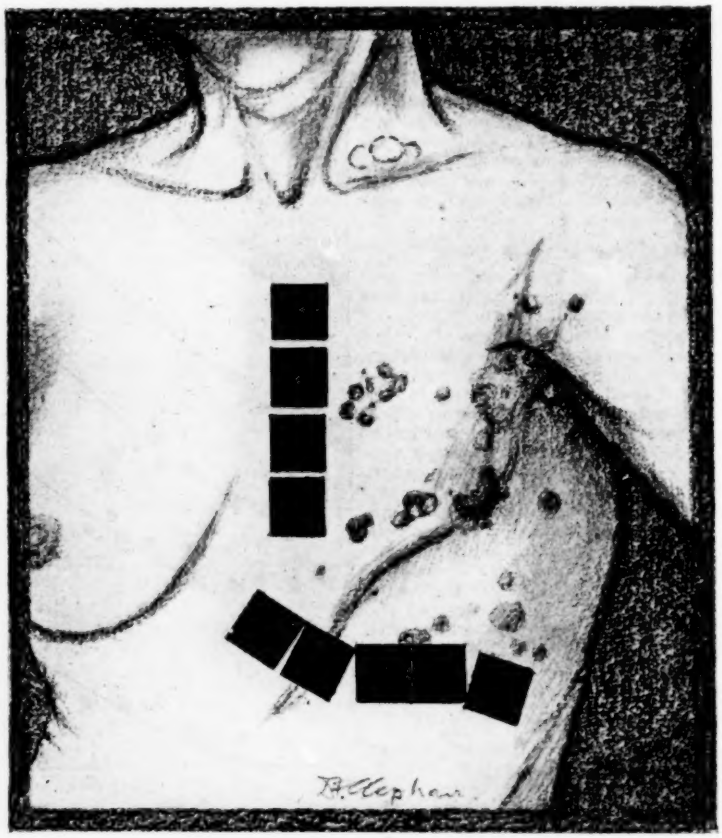
time the radiation was given—a very reasonable hypothesis—and further assume that the subsequent developments were due to the action of the radium, we arrive at the following data. Two radium tubes each of 12·5 mg. shielded by 1 mm. of platinum and acting for 24 hours, give destruction or prolonged inhibition of cancer cells within a radius of about an inch. At a distance of 4 in. from the focus there is a maximal active stimulation of cancer cells, manifesting itself within eight days. After 32 days stimulation effects had shown themselves over a zone covering points situated between 2 in. and 4½ in. from the focus, but with a focus of maximum stimulation 4 in. from the focus. After 48 days stimulation, or mere failure of inhibition, was manifested at points as near as within one inch of the focus, while at the periphery of the field 4½ in. from the focus there was a suggestion that the stimulated nodules were again receding—i.e., that very weak doses of radiation have only a temporary stimulating effect.

This case standing alone has only a suggestive value, though I could produce others in support of it. If a long incision into the subcutaneous tissue were made in an animal, and if carcinoma cells were planted along the incision in a line, as potatoes are planted in a trench, the application of a radium focus at one end

of the incision should give information as to the stimulating or depressing effects of radiation expressible in exact mathematical terms. There has, I think, been a tendency to ignore the possible stimulating action of small doses of radiation, partly because of the absence of exact data with regard to it, partly because of the fear of exciting prejudice against a novel method of treatment. But the position of radiation in the treatment of malignant disease is now so unassailable that the second objection no longer holds. In any case to ignore difficulties is to perpetuate them.

If these provisional conclusions be accepted as facts I think there emerges a principle of great importance in the radiation treatment of malignant disease, whether by X rays or by radium—namely, that a careful endeavour should be made to delimit the area in which cancer cells are likely to be present, and that the periphery of the area thus marked out should first be treated. The treatment of the central part of the area should be reserved to the last. These remarks naturally refer to cases in which the whole area affected is too large to be treated at one sitting.

FIG. 2.



Radium barrage. 20 mg. capsule.

Take, for instance, a case of primary carcinoma of the breast. A circle of 10 or 12 in. with the growth as its centre may require to be irradiated. In my judgment the whole periphery of this circle should be treated before the palpable primary growth is submitted to the rays. The opposite, and, I believe, the usual practice is to irradiate the primary lump first and most, and so incur the risk of delivering a small stimulating dose to its microscopic extensions and driving them further afield. I make these suggestions with more confidence because in the field of radiosurgery I have tested this encirclement method and have found it to produce a great improvement in results. It deals effectively with the zone of microscopic infiltration and permeation. If, on the contrary, a central method of treatment is adopted this zone is stimulated to increased activity, and though the primary growth may disappear its dissemination is actually hastened.

In regard to diagnosis I wonder if radiologists take every opportunity open to them to verify their findings. Do they sufficiently study the pathology of the living (the phrase is from Sir Berkeley Moynihan's mint) as revealed in the operating theatre in cases which they have previously submitted to X ray examination? In connexion with this question I feel certain that the radiologist might with advantage oftener visit the wards and the operating theatre and the surgeon more frequently be found in the X ray room. Conference between colleagues is much better than the exchange of reports. Now that diagnosis and therapeutic radiology are both of them such large subjects it is worth considering whether the art of radiology would be advanced by a more complete separation between these two branches of practice.

THE STUDY OF RADIO-HISTOLOGY.

Surgery, like therapeutic radiology, is an art combating local disease by local measures, and there are some who believe that technique and manipulative skill are the sole necessary qualifications of the surgeon. This view has never held sway in England, for the founder of the English school of surgery, John Hunter, was an experimental pathologist who combined in himself the functions of the researcher and the surgeon. The Hunterian museum of the Royal College of Surgeons of England, a collection without rival in the world, is a standing witness to the belief of English surgeons that pathology is the real basis of successful surgery, and that technique is by comparison but its necessary handmaid.

Now it appears to me that just as surgery may be led astray by the exclusive, I will not say the undue, exaltation of technique, so, too, may radiology. An intimate knowledge of the pathology of the conditions with which he deals is just as necessary for the radiologist as for the surgeon. Probably more than half the therapeutic work of radiologists is concerned with cancer. I feel certain that a closer personal study by radiologists in their earlier years of the way in which cancer spreads would increase the efficiency and success of its radiological treatment. This is all the more necessary if, as seems likely to happen in the near future, radiation largely replaces the knife in the treatment of cancer.

Radiologists, like surgeons, must attack their own special pathological problems, for the pathologist, with his illimitable field of research, generally considers pathological histology an exhausted area and is too busy to enter it. May I here suggest that the

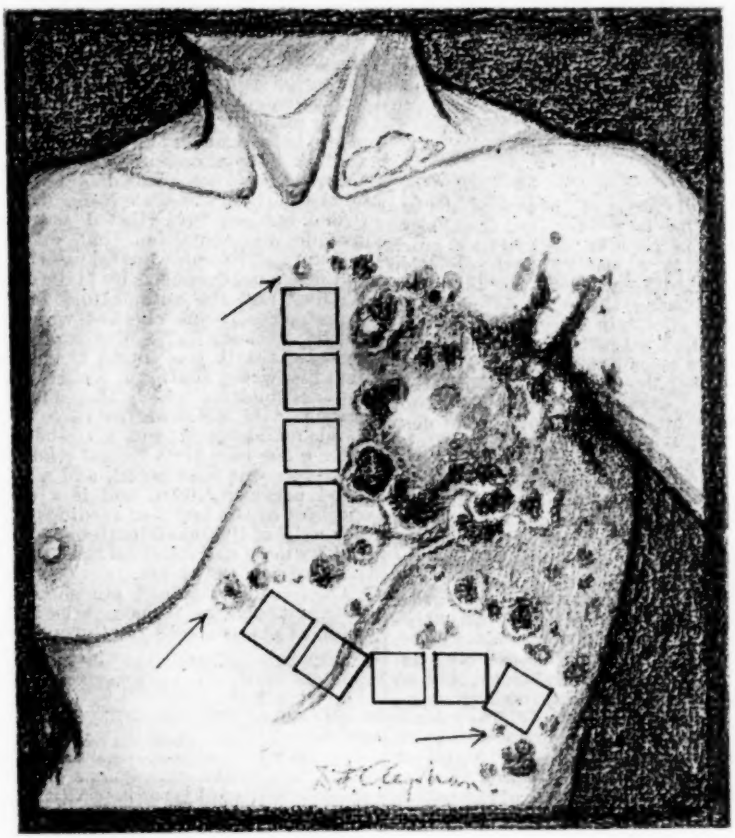
universities of Cambridge and Liverpool, which have given such powerful aid to radiology by the institution of a diploma in the subject, and more recently by creating lectureships, should reconsider their syllabus so as to direct the attention of candidates more closely to those parts of pathology which bear upon radiology.

Correct and precise ideas on the mode of spread of cancer are vital to a therapeutic radiologist, and I may be allowed here to refer to my own work on the dissemination of breast cancer by permeation, which not only placed operative treatment upon a rational basis but has indicated also someconditions of successful radiological treatment. In a paper read in 1919 before the Electro-Therapeutic Section of the Royal Society of Medicine I tried to show how at that time some X ray treatment was vitiated by undue restriction and bad centring of the field of radiation, by exclusive attention to the lumps which could be seen and felt without regard to the microscopical extensions of the disease, and sometimes actually by failure to undress the patient and examine the tumour before its treatment was begun. This incursion of a surgeon outside his own territory was taken in the friendly spirit which inspired it.

To illustrate what I mean I shall now draw attention to a few pathological observations which bear directly on the radiology of breast cancer. 1. In what appears to be the healthy region round a cancerous deposit there is probably a zone of microscopic infiltration, and outside this again a region of permeation, where the lymphatic vessels are choked by cancer cells. 2. Breast cancer invades the abdomen frequently by direct infiltration in the epigastric angle. 3. The glands along the internal mammary artery, which lie within the thoracic cavity, are invaded at about the same time as the axillary glands. 4. The plane in which external cancers spread is the plane of the deep fascia, because in that layer the main lymphatic plexus lies. Such cancers do not spread in the plane of the skin. 5. Tuberculous lupus, like cancer, is an invasion of the lymphatic system. It is not a skin disease but a lymphatic disease. The moral of these observations is too plain to need pointing. I may, however, remark that to cure either lupus or cancer an effective dose of radiation must not merely impinge upon the skin, but must be carried down at least to the plane of the deep fascia.

In order to illustrate the importance of correct pathological ideas in the field of practice, may I now describe an experiment which, with the patient's full consent, I carried out upon a case of recurrent breast cancer where numerous secondary nodules were spread over an area of the thoracic wall. In such cases X ray treatment directed to the visible and palpable nodules causes them to disappear, but the disease continues to spread and fresh nodules appear at the periphery. The reason, of course, is that beyond the remotest nodule there is a peripheral zone, lying in apparently healthy tissue, where the microscopic growing edge of the disease is spreading by permeation in the fascial lymphatic plexus. With the coöperation of Prof. Russ and of my registrar, Mr. Muir, a line of radium capsules, broken in the middle by an intentional gap, was laid down in the presumed situation of the microscopic growing edge over skin which appeared quite healthy and a maximal skin dose was administered. *No treatment was applied to any recognisable focus of disease.* Opposite the radium barrage the nodules ceased to spread, while they continued in the subsequent months to advance through the gap left in the radium barrage, and round its ends. Radiation had destroyed or inhibited the microscopic growing edge (Figs. 2 and 3). This experiment, which I have repeated since, is surely a proof that to see a cancer as it really is one must close the eyes and use the imagination (Figs. 1 and 2).

FIG. 3.



Showing permeation round edges of barrage.

I venture to suggest that young radiologists should be encouraged to study the pathological side of radiology for themselves first by the establishment of a museum, in charge of a histologist whose opinion would in the course of years become of decisive value in radio-histological questions, and secondly by the establishment of one or more research scholarships in radio-histology. Now that the technical equipment of therapeutic radiology has reached such a high degree of power and accuracy, I am convinced that the nation which first places the subject upon a complete pathological foundation will lead the way to fresh triumphs. Now that radiology has come of age and

can control its powerful weapons, its future depends upon a closer study, from its own particular angle, of the diseases it has to fight, and of the tissue changes produced by radiation.

In conclusion, may I be allowed to express my personal thanks for help received to Dr. Douglas Webster and his staff at the Middlesex Hospital, and to many other radiologists from whom I have had friendly help and counsel.

BLOOD PRESSURE IN THE AFRICAN NATIVE.

ITS BEARING UPON THE ÆTIOLOGY OF HYPERPIESIA AND ARTERIO-SCLEROSIS.

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IN the investigation of causes of diseases of obscure ætiology, a factor that has as yet received insufficient attention, but which is capable of yielding much information of value, is a study of the relative incidence of disease in different races of mankind. For instance, in considering the possible causes of the prevalence of appendicitis in European countries, many writers have called attention to the rareness of this disease in native races living under conditions that have been but little influenced by the civilisation of white races.[1] The same statement has, not infrequently, but very incorrectly, been made concerning cancer. These comparisons are of special interest in those diseases that are alleged to be due to modes of living in civilised communities. A group of such diseases which occupies much attention nowadays are the allied conditions of hyperpiesia, arterio-sclerosis, and chronic interstitial nephritis, and it is to a consideration of these conditions that this paper is devoted.

The investigations recorded here were all carried out on natives living in one of the largest of the native reserves in Kenya Colony—namely, South Kavirondo, situated on the shores of Lake Victoria Nyanza. These natives live under primitive conditions, that is, under conditions which have probably undergone no appreciable change for many centuries. They have been but slightly influenced by the colonisation of Kenya, the main influences to which they have been subjected, government and missions, tending to raise the standard of the present mode of living of the native rather than to introduce any radical change in that mode.

Normal Blood Pressure in the African Native.

A consideration of the incidence of hyperpiesis amongst African natives entails, first of all, consideration of the normal blood pressure. Our knowledge of normal blood pressure at present rests upon figures chiefly gained from large numbers of records collected mainly in America.[2] It would be unwise to assume that the normal for an American citizen anxious to insure his life should also be the normal for an African native. Consequently a series of investigations upon apparently healthy natives was carried out. It is necessary, first of all, to place on record the conditions under which these investigations were made and the methods adopted.

The observations were carried out on the four main tribes occupying the South Kavirondo district—the Wakisii, Luo, Abakuria, and Abasuba. Men only were investigated. Recruits for labour in various parts of Kenya are examined in large numbers at Kisii Hospital, and these provided a large number of healthy young subjects for investigation. Older men were not so easy to procure at Kisii, but these were more readily obtained whilst on tour in the native reserves when the older men gathered together in council. It should be pointed out that the investigations at Kisii were carried out at an altitude of about 5700 feet, and, on tour, in country varying in altitude between 3500 and 5000 feet. It seems unlikely that such altitudes could have any marked influence upon the blood pressure of inhabitants.[3] Determination of the age of the natives was not easy. Natives rarely have any idea of their own ages, consequently their ages had usually to be estimated. No claim is made for strict accuracy with regard to the ages shown in the following table, but it can at least be claimed that they were grouped fairly correctly in relative age groups. It seems that it is uncommon for natives to reach what is called old age in the European. Occasionally natives were seen who seemed perhaps 70 to 80 years of age, but they were only met with infrequently. Consequently all natives judged to be 60 years of age or over were grouped together for purposes of calculation.

The instrument used was an aneroid sphygmomanometer made by Messrs. Down Bros. At the conclusion of the investigation the instrument was tested against another sphygmomanometer that was known to be accurate. No error was detected greater than 2 mm. on the parts of the scale in regular use.

The subject investigated was first examined to exclude any condition that might influence blood pressure. The rules for taking the readings, systolic and diastolic, described by Halls Dally, were followed closely,[4] and the auscultatory method was adopted as a routine, being checked where necessary by the tactile method. The first reading was always disregarded, as it was found that the African native, like his white brethren, suffers from apprehension and nervousness which frequently affect his blood pressure; in fact, in a few cases no constant reading could be obtained and no record could be made. After a few minutes a second reading was taken. The pulse-rate was then noted, and a third reading of the blood pressure taken, and if a constant figure was obtained in the last two readings a record was made.

A series of 1000 examinations was made in apparently healthy male natives of all ages, ranging from 15 years to about 70 or 80 years.

The results obtained are shown in the following table, with figures, for comparison, derived from large series of observations on Europeans and Americans.

Age group.	Cases examined.	Aver. pulse-rate.	Blood pressure.			Normal in Europeans and Americans.[5]		
			Aver. syst.	Aver. diast.	Aver. diff.	Syst.	Diast.	Diff.
15–19	99	68·71	123·07	81·89	41·18	123	80	43
20–24	100	63·22	122·76	79·99	42·77	125	81	44
25–29	100	63·57	126·37	83·96	42·41	126	82	44
30–34	115	64·55	126·05	84·73	41·31	127	83	44
35–39	100	69·46	125·55	85·86	39·69	128	84	44
40–44	93	68·52	118·32	81·29	37·03	129	85	44
45–49	96	69·17	113·19	75·50	37·69	131	86	45
50–54	100	72·20	109·79	74·09	35·70	133	87	46
55–59	100	70·73	106·59	69·63	36·96	135	88	47
60 and over	97	75·23	105·76	66·98	38·78	140+	90+	50+

Syst. = systolic; diast. = diastolic; diff. = differential.

It will be noted that the figures differ distinctly in the two races. Up to the fourth decade the figures for the two races agree approximately. After that the blood pressure, both systolic and diastolic, tends to come down in the African, whereas in the white races it continues its tendency to rise until the eighth decade.

Incidence of Hyperpiesia, Arterial Degeneration, and Chronic Nephritis.

The highest systolic blood pressure recorded during the course of the above investigation in a subject showing no pathological condition and no detectable signs of nervousness was 172 mm. This was observed to persist for about two hours, but unfortunately the case could not be followed up. Another case was found to be 150 mm., and this was observed to persist for two days. In nervous subjects it was not

uncommon to find a systolic blood pressure of over 200 mm. temporarily. It was very uncommon, however, to meet with a systolic blood pressure that persisted for long above 144 mm. Over two years at a native hospital, during which period approximately 1800 patients were admitted, afforded good opportunity for recognition of pathological conditions that might have arisen in the native population as a result of high blood pressure, arterial degeneration, and chronic nephritis, and where any suspected case was admitted blood pressure was recorded. No case of raised blood pressure was encountered, though abnormally low blood pressure was not uncommonly noted. On no occasion was a diagnosis of arterio-sclerosis or chronic interstitial nephritis made. One case was encountered that gave a history suggestive of angina pectoris, but no abnormality was detected on examination, and the blood pressure was 105/74. Occasionally cases of hemiplegia are seen amongst natives, but such as I have had the opportunity of examining have occurred in young men, have presented no cardiovascular abnormality, and circumstances have suggested that relapsing fever may have been the cause. Aortic incompetence has been occasionally recognised, but these cases have either occurred in young natives or have probably been of syphilitic origin. Hypertrophied hearts, without intrinsic cardiac disease to account for the enlargement, are very rarely met with in the African. Cases are sometimes met with in which the apex beat is displaced to the left, but after investigation of a number of these cases I arrived at the conclusion that the heart was displaced and not enlarged. There was no evidence of any myocardial inefficiency, and the blood pressure was invariably within normal limits.[5] Opportunities for carrying out post-mortem examinations have often occurred, and it has been noted that the native African usually shows much less atheroma in the aorta than does an average European of the same age. In a man of 30 frequently no signs of atheroma can be seen, and a man of 50 will often show slight traces only.

The results of this investigation thus lend support to the view that hyperpiesia and arterio-sclerosis are diseases associated with civilisation. Hyperpiesis has been recorded as quite common in Egypt by Ismail,[6] but this is a country that has been considerably influenced by European and other civilisations, recent and remote. Furthermore, Ismail points out that the disease is almost confined to middle, upper, and more educated classes, and is rare amongst hospital patients. It is of interest to record here that senile calcification of the aorta has been noted in the mummy of Meneptah (reputed Pharaoh of Egypt), and is to be seen in the museum of the Royal College of Surgeons.

Ætiology of Hyperpiesia.

Two main views of the causation of high blood pressure at present are described—namely, (1) the toxæmic theory, and (2) the view that the condition arises as the result of an over-responsive vaso-motor system, which has been described as the mental stress theory. Two sources of toxin have been stressed as possible causes of hyperpiesia and arterio-sclerosis—viz., (1) a focus of chronic infection, (2) derivatives of protein digestion. It is difficult to suggest forms of chronic infection that are common in Europeans and that are rare in the African native. Pyorrhœa is very common in natives under 30 years of age, and almost universal above that age. Tonsillitis is common, and nasal sinus infection is sometimes seen. Chronic ulcers of the leg are very common amongst them, and constitutional toxic effects due to them are frequently seen. Constipation is just as prevalent, I believe, as in England. Other conditions that are stated to be toxæmic in origin are common, as chronic arthritis and rheumatoid conditions. Meat is frequently consumed by the races in South Kavirondo, though possibly not to the extent that it is consumed in England. In this connexion some observations upon blood pressure in the Masai tribe, who feed largely on milk and ox blood, would be of interest.

The other view, of which one of the leading protagonists is Lord Dawson, is briefly that hyperpiesis is the result of a "high pressure existence" or of mental stress. I think almost everybody who has been closely associated with the African native will agree that he very rarely can be described as living a high pressure existence. McDowall[7] has suggested that the physiological rise in blood pressure that occurs as a result of mental stress is to provide for the increased muscular activity that should naturally follow occasions that create mental stress, but that under civilised conditions mental stress often fails to be followed by its physiological safety valve of muscular action. This view certainly receives support from the rarity of high blood pressure in the African native.

Comparison of Normal Blood Pressure in European and African Races.

Further allusion must be made to the differences between the normal blood pressures for the two races. Under the age of 40 years the figures for both systolic and diastolic blood pressures are very similar for the two races. Above that age the blood pressure for the European rises steadily up to the age of 80, after which it falls. The average blood pressure at 60 years of age is 140 systolic and 90 diastolic in the European, whereas in the African it is 105 and 67 respectively. The contrast is somewhat striking, and seems to require explanation. In both races there are, of course, fairly wide variations compatible with health, and figures of value can only be obtained by taking averages of large numbers. Systolic blood pressures of below 100 mm. are common in the African, and 110 were noted in the above observations. No less than seven cases were encountered of systolic blood pressures below 80 mm. in natives who appeared to be quite healthy. These natives were all considered to be 55 years of age or over.

Individual variations compatible with health are noted to occur in response to physical and psychical changes. Similarly, prolongation of, or constant repetition of, such stimuli has been suggested as being responsible for pathological changes. To apply these analogies to the racial variations it may be possible to evolve a hypothesis to account for such racial differences. The native African, or at least the type who lives in the native reserves, amongst whom these investigations were carried out, has probably for a large number of generations lived in a manner that has undergone but very slight change. The European and American populations have, on the other hand, seen revolutionary changes in their mode of living in a very few generations as a result of the industrial revolution of the nineteenth century, the increased facilities for travel and communication, the growth of large cities, and the increasing complexity of warfare. That such developments have had their effect upon the diseases of the race is undoubted. I suggest that such differences in the evolution of the two races could be held responsible for the differences in their normal standards of blood pressure; in other words, that the greater mental stress required by the ordinary European citizen in his everyday life, as a result of the tendencies of modern civilisation, has had its effect upon the physiology as well as the pathology of the race.

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RADIUM THERAPY OF CANCER OF THE BUCCAL CAVITY.*

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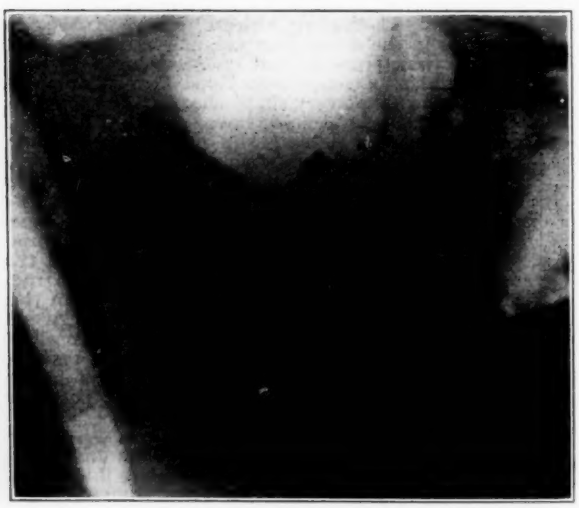
(WITH COLOURED PLATE.)

IT is now established that primary cancer of the tongue can be made to disappear by means of radium in a large proportion of cases. Quick [1] in America, Regaud [2] in France, Ledoux [3] in Brussels have used this method of treatment well over five years, and the time is not far distant when statistics based on a minimum period of five years survival will be available in this country. The best results are obtained in early and operable cases—in these the disappearance of the growth depends upon a correct technique. In inoperable cases good results are obtained locally, although the problem of the extraoral extension of disease is still bristling with difficulties. Hopelessly advanced cases, so frequently sent for radium therapy, are beyond the stage where any form of treatment is of value, and to expect "cures" in this group of patients is at present to expect miracles. Radium treatment does not always result in a complete disappearance of the growth, and occasionally a local recurrence is seen two or three years after irradiation. In my experience a second treatment is possible and sometimes gives excellent results. Harmer [4] advocates diathermy excision of the scar left after irradiation. Radium treatment in careful hands often transforms an inoperable case into one suitable for operation.

Pathological Considerations.—The treatment of oral neoplasms by means of radium depends on the selective action of the gamma rays upon the newly developed cells. From the earliest days of radium therapy it was recognised that cells in mitosis were more sensitive to irradiation than cells at rest. But

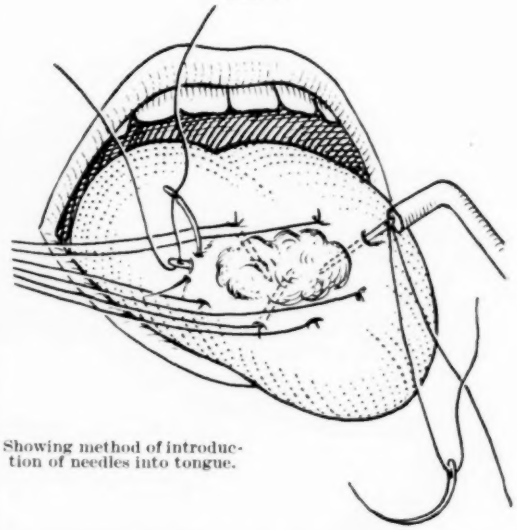
FIG. 2.



Skiagram of mouth showing 14 platinum seeds in the posterior part of the tongue.

he success or failure of treatment does not depend solely upon the response of the cell to irradiation. It has been shown that the effect of irradiation on the stroma is equally important. Roussy [5] has shown that a good result may be expected in those cases where the disappearance of mitosis and cellular disintegration is unaccompanied by changes in the stroma. Personal observations on biopsies in cases of lingual cancer fully support Roussy's observations,

FIG. 1.



Showing method of introduction of needles into tongue.

and prognosis is bad in cases where the tissues are œdematous or scarred by previous fibrosis, due to so-called "precancerous changes."

Whatever the mechanism of the action of radium on the growth, the effects of irradiation are partly dependent on the blood and lymph supply of the tissues, and the state of circulation in the irradiated part influences materially the results obtained from gamma ray therapy.

The tongue and oral cavity offer a field eminently suitable for close observation of the effects of irradiation on the growth, as the changes can be inspected daily. From continuous clinical observations in a series of 50 cases it is seen that between irradiation and the appearance of the changes a period of time elapses which varies with various factors. This "latent" period is of clinical importance, as both malignant cells and normal tissues, although apparently not affected at the end of treatment, are profoundly and permanently affected, the outward change not becoming apparent for a variable period of time.

There are four types of neoplasms commonly seen in the mouth: (1) the papillary, (2) the nodular, (3) the ulcerous, (4) the fissured. The degree of malignancy of these groups when considered from the point of view of "excisional" surgery is in the order mentioned. From the point of view of radium therapy the prognosis is reversed, and the papillary type, which is the most malignant, responds most rapidly to irradiation. The more rapidly the tumour grows the more sensitive it is to the effect of gamma rays. The sensitivity of tumours to irradiation can be increased by artificial means which are at present being investigated.

Anatomical Considerations.—Whatever the situation of the neoplasm its response to irradiation is the same. The results are better in the anterior group owing to the simplicity of technique in this situation. The posterior part of the tongue presents difficulties in approach and the extent of the lesion is easily underestimated. Growths of the inferior aspect of the tongue and floor of the mouth extend early beyond the intrinsic muscles of the tongue; they involve the alveolar margins and bone. This renders

* Based on a paper read at the International Conference on Cancer, London, July, 1928.

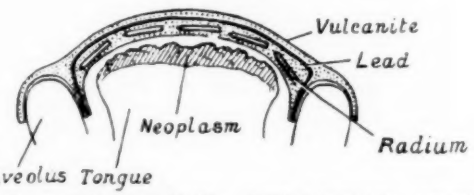
treatment difficult. Early lesions in the floor of the mouth give good results.

Methods of Irradiation.

The technique of irradiation varies with the anatomical site of the disease. Three methods of irradiation are used in the treatment of cancer of the buccal cavity.

1. *Interstitial Irradiation.*—This method consists in the introduction of radium salt or radon emanation

FIG. 3.

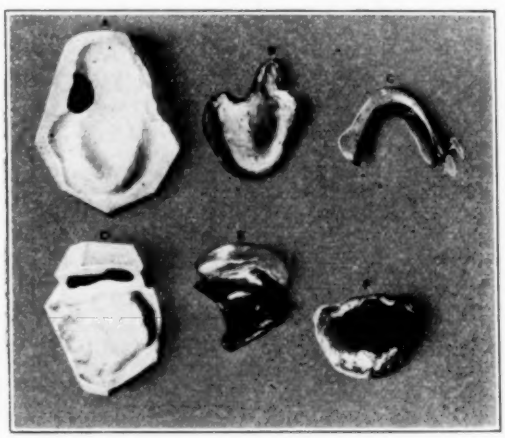


Method of surface application showing vulcanite apparatus containing radium. A lead lining protects the roof of the mouth and lower jaw.

screened by platinum into and around the tumour. It is most suitable for growths of small size and easily accessible to manipulation. The use of platinum needles is the method of choice in the treatment of lesions of the tongue and floor of the mouth. For tumours of small volume it is sufficient to surround the lesion with needles; if the lesion is extensive it is necessary to introduce the needles into the tumour as well. The advantages of this method in selected cases are (1) the possibility of calculating the dose carefully and accurately, (2) homogeneous irradiation, (3) prolongation of period of treatment, since normal tissues are protected by the multiplicity of foci and maximum screenage.

2. *Caritary Method.*—This method is suitable for the treatment of cancer of the palate, uvula, certain

FIG. 4.



Showing method of making plates for the application of radium to the palate and buccal mucosa. A, plaster-cast of palate; the black area outlines the growth. B, lead-lined vulcanite plate made from A. C, protection plate for lower jaw. D, plaster-cast of floor and side of mouth; the black area outlines the growth. E, plate made from D, carrying small box for irradiation. F, model made of stent, roofed with lead for surface application to tongue.

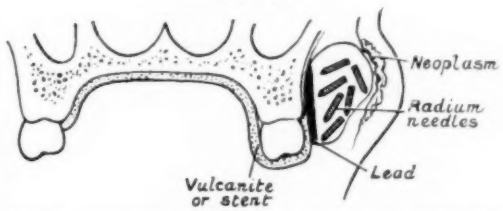
types of epitheliomata of the cheek and lip. A plate similar to a denture is used. This appliance is made for each individual case. It is made of vulcanite, stent, or composition, lined with lead, and carries the requisite amount of radium. The application may be continuous or interrupted, and is prolonged till the desired reaction is obtained. The palate and buccal aspect of the cheek are the only situations where this method is used in preference to interstitial irradiation.

3. *Surface Application.*—By surface application is meant the application of radium at a short distance from the skin. The distance at which the radium is placed varies with individual schools. At Westminster Hospital 15 mm. is the standard distance. The substance employed is known as Columbia paste.[6] Collars are made so as to cover the whole or part of the neck. This method is used for the treatment of secondary cervical deposits. The details of the preparation of the paste collars have been published elsewhere.[7]

Treatment.

The treatment of oral cancer is carried out in two or three stages. It consists in the treatment of the primary lesion by means of radium followed two or three weeks later by the treatment (surgical, radiological, or combined) of the lymphatic area. The reasons for adopting this method, which clinically give satisfactory results, are based upon the necessity of preserving the best possible blood and lymphatic

FIG. 5.



Vulcanite apparatus carrying small box containing the radium for carcinoma of cheek. Lead protection to maxilla. Apparatus to be worn two weeks or more.

supply to the area treated. The disappearance of the tumour is hampered by the removal of lymphatics and ligation of blood-vessels, which, of course, is the object of the operation on the neck. This step therefore should be left till the primary growth has been successfully dealt with.

Primary Growth: Technique.

Tongue.—Before introducing radium it is necessary to carry out a scrupulous toilet of the mouth. Carious teeth are extracted, metal fillings removed, tartar scraped, and sepsis eliminated as much as possible. The introduction of radium needles is carried out under local or general anæsthesia according to the temperamental suitability of the patient for one or the other method; for lesions on the postero-dorsal aspect of the tongue, intratracheal anæsthesia through a nasal catheter is the method of choice. The growth is carefully examined and needles are introduced around it into healthy tissue at a minimum distance of 1 cm. from each other. The needles must be completely buried in the substance of the tongue, the linen thread only protruding at the surface, as otherwise small areas of necrosis occur around the protruding eye of the needle. The threads are passed through the substance of the tongue, tied at one end and cut short (Fig. 1). The long ends are collected into a rubber tube and attached to the skin of the cheek by means of strapping. The protection of the rest of the mouth, specially the palate and the alveoli, is obtained by means of dental plates lined with lead. When dealing with a neoplasm situated far back on the posterior aspect of the tongue, the introduction of needles may present serious technical difficulties. In this position platinum radon seeds are of great advantage (Fig. 2). Seeds are easily and quickly introduced and need not be sutured in. They can be placed and kept in position in situations inaccessible to needles. When platinum seeds are used in the mouth, no protection of the bony arches is required. But from the point of view of uniform intensity of

irradiation needles are superior to seeds. In cases where most of the tongue is involved by the disease and it is difficult to keep the needles in the tissues for the desired period of time, surface application by means of an intrabuccal apparatus is an alternative but less efficient method of applying radium (Figs. 3 and 4 (E)). The duration of surface application is 14 days.

FIG. 10.

Epithelioma of palate: before treatment.

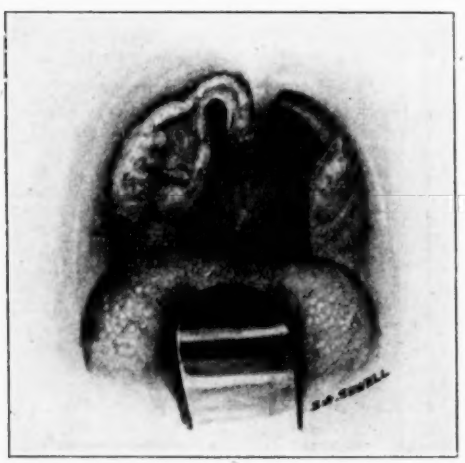
FIG. 11.

The same case as Fig. 10 showing a radium burn.

Dosage.—Needles containing 0·6 mg. and 1·33 mg. of radium screened with 0·5 and 0·6 mm. of platinum are used. Their number varies with the extent of the growth. As a rule eight to ten needles are required. They are left in position seven to nine days. The total dose varies from 800 to 1600 mg. hours.

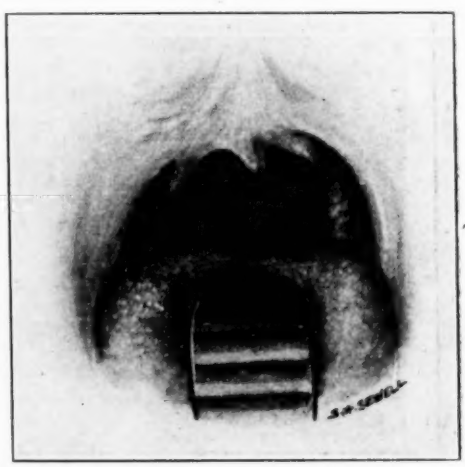
Pillars of Fauces and Uvula.—The method of choice is irradiation by means of radon seeds. The seeds are introduced by means of a trocar and cannula round and behind the growth. Regular distribution is aimed at, the seeds being placed at a distance of 1 cm. from each other. The seeds have an initial strength of 1·8 or 1·2 millicurie each. Eight or ten seeds are necessary according to the extent of the lesion. They are left in position 10 to 14 days. The patient is examined every second day and the seeds removed when there is evidence of reaction manifested by redness and slight œdema. Hospitalisation is not essential, and the majority of cases can be treated as out-patients at this stage. If seeds are not available, small needles 9 mm. long containing 0·5 mg. of radium, screened by 0·5 mm. of platinum, are used; they must be securely sutured in position and this is facilitated by the use of cleft-palate needles. Protection of the hard palate and lower jaw is necessary owing to the continuous maximum intensity during the whole period of treatment. The needles are left in position seven days. The total dose is 1000 mg. hours.

FIG. 14.



Epithelioma of the palate and tonsil (diagnosis confirmed by biopsy).

FIG. 15.



The same case as Fig. 14 five weeks after radium treatment (total dose, 705 mg. hours).

Palate.—Intrabuccal surface application is the method of choice and is suitable for all cases except those involving the free border of the palate and uvula. A plaster cast of the roof of the mouth and the lesion is taken (Fig. 4 (A)). A vulcanite or stent apparatus is made and lined inside with 1·5 mm. of lead (Fig. 4 (B)); a window corresponding accurately to the extent of the lesion is cut in the upper surface of the plate; needles containing 2, 1·3, and 0·6 mg. of radium are placed

FIG. 6.—Epithelioma of tongue and floor of mouth before treatment.

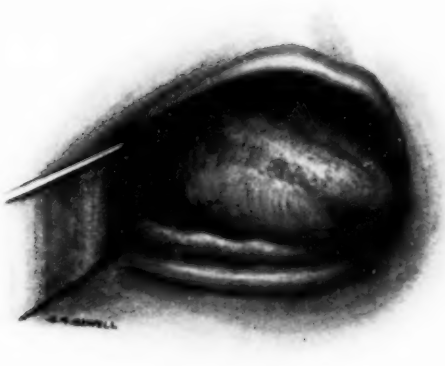


FIG. 7.—The same six weeks after radium treatment.

FIG. 8.—Epithelioma of tip of tongue with well-marked leucoplakia.

FIG. 9.—The same six weeks after treatment. The epitheliomatous ulcer is healed. The leucoplakia remains.

FIG. 12.—Epithelioma of the left side of tongue (diagnosis confirmed by biopsy). Wassermann reaction positive.

FIG. 13.—The same three weeks after treatment.

Fig. 1.

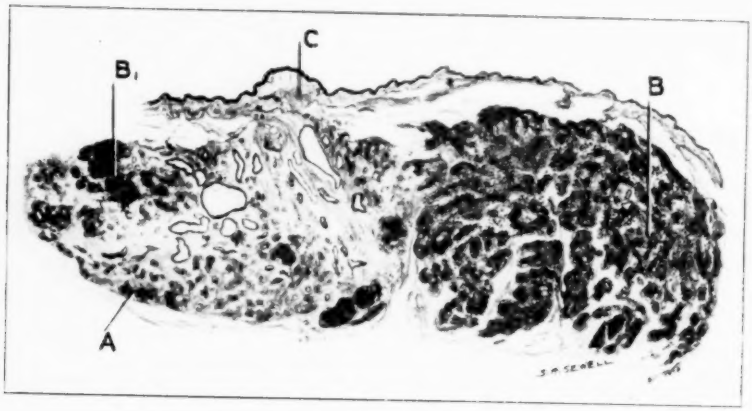


Fig. 2.

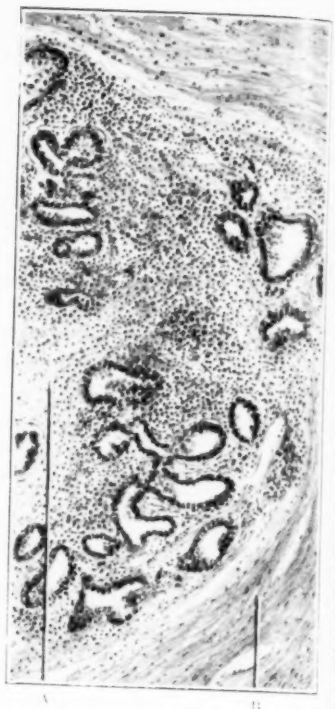


Fig. 4.

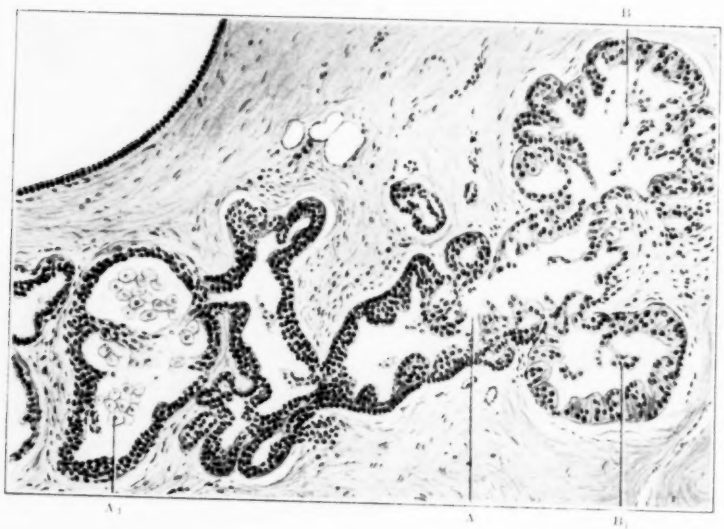
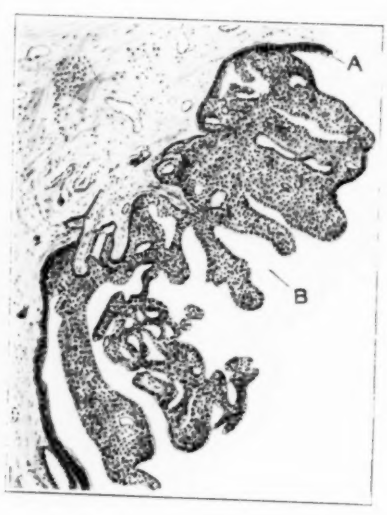


Fig. 8.

Fig. 5.

Fig. 7.



Descriptions of the illustrations ar
be found in the text of the artic

on the plate and covered with vulcanite; 15 mg. of radium are required. The plate is worn day and night for 10 to 14 days. It is removed daily and a mouth wash given. At the end of five days the needles are rearranged so as to obtain a more uniform irradiation. The results are satisfactory and extensive carcinomata involving nearly the whole palate have been made to disappear.

Buccal Mucosa.—Epithelioma of the cheek responds well to radium treatment. The extent of the growth is the main factor in the choice of the technique adopted. Surface application from inside the mouth or externally may be used as an alternative to needling in this situation and by this method there is less risk of perforation of the cheek and a more even distribution of radium is obtained. Needling with very small needles or seeds gives very good results. For a localised growth not involving the muscles of the face, a stent or shellac shield is made to fit either the lower or upper jaw whichever is most suitable for the individual case. A plate is attached to the apparatus so as to keep in contact with the neoplasm. The plate consists of a layer of lead 1·5 mm. thick, covered with stent, the radium is placed on the stent (Fig. 4 (D, E) and Fig. 5). The apparatus contains 10 mg. of radium and is worn for seven to ten days. Total dose: 2000–3000 mg. hours. If the growth has invaded the muscular layer of the cheek and there is difficulty in opening the mouth, external application by means of columbia paste is resorted to. The dosage in this case is increased to 5000 mg. hours.

Cervical Lymphatic Glands.

Operable Cases.—One month after irradiation of the primary growth, operative removal of the glands on the side of the lesion is carried out. The operation must be extensive and aim at the eradication of all the glands, deep fascia, sterno-mastoid muscle, and internal jugular vein—following Crile's technique. The removal of the sterno-mastoid simplifies the operation and gives a much better exposure of the glandular area. The removal of the internal jugular vein with all adjacent glands should be carried out from just above the clavicle up to the base of the skull or as near to it as practicable. All the glands removed must be individually examined histologically, and only in the absence of any deposits is no further treatment indicated. If one gland shows a secondary deposit, the neck must be irradiated.

Irradiation.—Three weeks after operation, when the wound is soundly healed, a Columbia paste collar 15 mm. thick is made. It covers both sides of the neck. An average of 70 mg. of radium is necessary. It is best to use needles of 1·3 or 2 mg. each. The operated side receives one third and the non-operated side two-thirds of the total quantity of radium. The average period of treatment is two weeks; the treatment is intermittent, the patient receiving 16 hours daily. The total dose is 10,000 mg. hours. This figure represents the dose emitted by the apparatus, and not the dose received by the patient. Erythema and superficial desquamation are the objective signs of sufficient dosage.

Inoperable Cases.—In cases where the mass of glands is fixed and involves the cellular tissues of the neck, complete surgical removal is impossible and radium therapy presents the only possible means of alleviating the patient. No case, however extensive the glandular involvement, should be left untreated. Bilateral irradiation is inadvisable in this group of cases. The reaction aimed at is severe and consists in complete peeling of the skin. It is important to irradiate the mass very slowly, and at least three weeks treatment is advised. The amount of radium varies with the size of the mass to be destroyed; 20–23 hours daily are given. The total dose amounts to 25,000–30,000 mg. hours. By this method good palliative results are obtained in cases where no other form of treatment is possible. As to permanency of these results, all that can be said at present is that patients have remained well up till two years after treatment, and when it is noted that these patients had large masses of glands and were inoperable, the results are encouraging.

It may be argued that if such results are obtained in inoperable cases, why not adopt this method in early cases and dispense with operation altogether? In the present stage of radium therapy the results are not sufficiently constant to justify this, and although palliation of symptoms and prolongation of life are obtained in inoperable cases, a combination of surgery and irradiation is still the best policy in operable cases.

Illustrative Cases.

The following five cases have been selected to illustrate the immediate results of radium treatment of cancer of the oral cavity. Case 3, one of the earliest cases treated, shows the result of bad technique, terminating in a radium burn. I am indebted to Dr. Braxton Hicks for all the histological and serological investigations in connexion with these cases, and to Mr. A. H. Clarkson for all the prosthetic work.

1. Mr. W. J., aged 50. Extensive carcinoma of the papillary type on the right side of the tongue and floor of mouth (see Coloured Plate, Fig. 6). There was a large mass of glands in the submental and submaxillary triangles. Biopsy: squamous-celled carcinoma. Treatment: 6 mg. of radium in 10 needles introduced around the growth and left in position seven days. Total dose: 1080 mg. hours. The primary lesion healed entirely (Coloured Plate, Fig. 7). Although the

SIR LENTHAL CHEATLE: LEGENDS TO ILLUSTRATIONS. (*See Plate opposite.*)

FIG. 1.—Whole section (natural size) of breast of woman, aged 32 years, who died in the seventh month of pregnancy. C = Nipple. B and B_1 = Active (genetic) growth of acini. A = Less active part from which Fig. 2 was drawn.

FIG. 2.—Section A from A, Fig. 1. Terminal ducts and acini in a lobule. The epithelium is in a state similar to that seen in mazoplasia. The pericanalicular and periacinous connective tissue has undergone hyperplasia. Among its fibres are seen many lymphocytes (compare with Fig. 3). B is the normal supporting connective tissue of the breast in which the lobule is embedded.

FIG. 4.—Section of breast. Terminal duct A_1 and A and its acini B, B_1. The duct ends and the acini begin about A where the elastica (unstained in this specimen) ends. The drawing represents a pure state of cystophorous hyperplasia. The shed colostrum-like cells in the transverse section of the duct A can be seen arising in all stages of formation from the epithelial hyperplasia within the wall of this duct. A collection of acini at B has become confluent and has formed an early cyst. Lining B_1 and B is the desquamative epithelial hyperplasia which is so typical of this state. In parts there is (unlike the hyperplasia in the duct) here and there a formation of small papillomata which are supported by delicate fibrillous stalks of connective tissue.

FIG. 5.—Section showing cystophorous hyperplasia in the groups of acini B where early cystic formation has begun. In the terminal duct A the epithelial hyperplasia is dysgenetic and strictly confined within distended but normal boundaries encircling the duct. There is a slight hyperplasia elastica which is not stained in this specimen. It is impossible to say how long the epithelial hyperplasia in the terminal duct will remain in its present state. It would be interesting to see this microscopical field at the end of about two years. There was no carcinoma of this gland. There were other parts of the same duct in which similar fields could be discovered.

FIG. 7.—A drawing of a part of a duct wall A from which has arisen a dysgenetic epithelial hyperplasia partly consisting of a papillomatous formation and partly sessile. B is placed in the lumen of the duct. The epithelial hyperplasia is still confined within distended but normal boundaries. The whole of a duct and its branches—of which this specimen is one—contained a similar dysgenetic epithelial hyperplasia. At one part epithelial cells had invaded outside structures and an early state of carcinoma existed. It was accidentally discovered in one of the whole sections that was cut and examined of this breast. There was no carcinoma in the lymphatic glands in the axilla which was cleared and examined microscopically.

FIG. 8.—Represents the two terminal branches A of a duct which has just divided (×30). The elastica is shown in this specimen and it has undergone enormous hyperplasia which also surrounds a few of the acini into which these two branches lead B and B_1. Dysgenetic epithelial hyperplasia of sessile type has taken place in the ducts and acini. Some of the epithelial cells have escaped into the surrounding connective tissue C and carcinoma therefore exists. Microscopical sections of the axillary lymphatic glands failed to reveal carcinoma.

glands were inoperable, a portion of the mass was removed, and a Columbia paste collar carrying 70 mg. of radium in 32 foci applied 18 hours daily for 18 days. Total dose: 22,600 mg. hours. The mass disappeared; there was extensive peeling of the skin of the neck. The patient died of cerebral hæmorrhage seven months after treatment; there was no local recurrence.

2. Mr. A. B., aged 56. Epithelioma of the tip of the tongue; on palpation a tumour the size of a walnut was felt in the anterior half of the tongue. The superficial ulcer involved the frenum; there was marked leucoplakia of the whole tongue (Coloured Plate, Fig. 8). Wassermann reaction: negative. Biopsy: squamous-celled carcinoma. Treatment: 8 mg. of radium in 8 needles introduced around and into the growth, and left in position seven days. Total dose: 1280 mg. hours. The tumour in the tongue disappeared; the ulcer healed. The leucoplakia was not affected (Coloured Plate, Fig. 9).

3. Mr. A. F., aged 60. Epithelioma of the palate. Early case suitable for radium treatment. The condition before treatment is shown in Fig. 10. An error of technique was committed and this had disastrous consequences. The needles used contained 5 mg. of radium each; the screenage was only 0·5 mm. of platinum. At present the needles employed for this type of lesion contain ten times less radium—viz., 0·5 mg.—and have the same protection. The total dose given was double the maximum dose: 4200 mg. hours. A radium burn resulted: the condition six weeks after treatment is shown in Fig. 11. The white slough took five months to separate, the adjacent portion of the palate was red and œdematous, the mouth was dry, there was intense pain. The patient died of exhaustion seven months after treatment.

4. Mr. H. H., aged 46. Very extensive ulcer on the left side and dorsum of the tongue (Coloured Plate, Fig. 12). No enlarged glands palpable in the neck. Biopsy: squamous-celled carcinoma. Wassermann reaction positive. Treatment: 6·6 mg. of radium in 11 needles inserted around growth and left in position seven days. Total dose: 1100 mg. hours. The condition three weeks after treatment is shown in Fig. 13 (Coloured Plate).

5. Mr. G. B., aged 53. Epithelioma of pillar of fauces, involving tonsil and extending to free edge of palate and uvula (Fig. 14). Enlarged glands on both sides of the neck. Biopsy: squamous-celled carcinoma. Treatment: 4·2 mg. of radium in seven needles introduced around and behind the lesion and left in position seven days. Total dose: 705 mg. hours. Complete cicatrisation of the lesion followed. The condition 5 weeks after treatment is shown in Fig. 15. A crile dissection was performed. This was followed by a radium collar.

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ROYAL NORTHERN HOSPITAL.—The recent anonymous gift of £35,000 for the building of a pay-bed block of 60 beds was conditional upon a similar sum being contributed by the public to the general needs of the hospital by the end of the year. This sum has now been successfully raised.

WEST SURREY HOSPITAL LEAGUE.—This organisation, which was formed recently to manage the contributory scheme in connexion with the Royal Surrey County Hospital, has already achieved considerable success. There are between 13,000 and 14,000 contributors, and it is believed that a total of 40,000 can be reached.

DIET AND PEPTIC ULCERS IN CAVIES.

BY H. E. MAGEE, D.SC. ABERD., M.B. BELF.,
W. ANDERSON, M.B. ABERD., F.R.C.S. ENG.,
AND
J. MCCALLUM.

(*From the Rowett Research Institute, Aberdeen.*)

THE ætiology of peptic ulcers in man is still obscure, and any experiments which throw light on it are therefore desirable. The experiments reported in this paper were drawn up not only with this object in view, but also to study the effect of deficient diets on the rhythmical movements of the surviving intestine. The results, therefore, fell into two categories, pathological and physiological. The former alone are dealt with in this paper; the latter will appear in another journal.

Experiments.

The experiments were done on cavies which were three-quarters grown when they began. For the physiological work it was necessary to kill off from day to day the animals which showed well-marked signs of malnutrition. This could not have altered the pathological findings to any appreciable extent.

Preliminary Experiment.—In a preliminary experiment 15 cavies were divided into five groups of three each and fed as follows:—

1. Cereals with grass and turnips—control diet.
2. Cereals—deficient in inorganic elements, especially calcium, chlorine, and sodium.
3. Cereals + minerals—inorganic composition adjusted so as to be similar to that of No. 1 ration in so far as analyses were available.
4. Cereals + minerals—bases as in No. 3, but acid radicles (Cl, PO_4, and SO_3) in excess relative to No. 1.
5. Cereals + minerals—bases as in Nos. 3 and 4, but acid radicles as in No. 2, i.e., low acid-base ratio.

Rations 2 to 5 were also low in vitamins, especially A and D. They were undoubtedly deficient, because all the animals fed on them went downhill very rapidly, especially those in Groups 2 and 4. No. 4 ration was the most unsuitable; two of the animals died seven and ten days respectively after being placed on experiment. The other was killed on the seventh day. No. 5 ration was evidently the most suitable, because the two animals that died naturally lived much longer than any of the other experimental animals—viz., 22 and 24 days respectively.

Post Mortem.—Group 1: No abnormality seen. 2: Congestion on gastric and duodenal side of pyloric sphincter in three, and of the cæcum in the region of the ileo-cæcal valve in two. 3: In three, congestion with hæmorrhages into the mucosa round the ileo-cæcal valve. 4: Large liver abscess in one, pneumonia in two. 5: In three congestion in the region of the pyloric and ileo-cæcal sphincters, and in one of these a well-marked intussusception of the jejunum. This was very probably not agonal, because the animal was killed intentionally.

Sections were made of affected portions of the pyloric region, the adrenals, and other tissues. Out of five cases examined microscopically, two showed hæmorrhages and three others excessive vacuolation of the cortex of the adrenal. The congestion in the pyloric region involved chiefly the loose tissue on both sides of the muscularis mucosæ, but often the muscle tissue was involved. In places the epithelium of the villi or glands was degenerated and there was evidence of hæmorrhage into the lumen. Congestion was found in the thyroid, kidney, pituitary, and pancreas.

The pyloric lesions were very slight in Group 2, and in Group 4 the lesions found post mortem (pneumonia in two and liver abscess in one) were most probably secondary to the malnutrition established by the diet. These results are interesting in view of the fact that ration No. 4 was clearly the most unsuitable, while ration No. 2 came next. They suggested that a higher incidence of local lesions would be obtained by employing diets with a slight, rather than a marked, deficiency. In subsequent experiments, therefore, we attempted to postpone a fatal issue for as long as possible by incorporating small amounts of green food in the diets of some groups.

Expts. 1, 2, and 3.—Three other experiments were done. The diets are shown in Table I. The animals in Group 1 in each of the three experiments were controls; their diets were adequate because they all grew normally and remained healthy. The animals in Groups 2 and 3 in each of the three experiments deteriorated from the start, and after a variable time developed signs of malnutrition. All the animals were given as much of their particular ration as they cared to eat, except that in Group 2, Expts. 1 and 2, green stuff was given in the amounts stated to each animal per day. No. 2 rations were all poor in calcium, sodium, and chlorine, and also in vitamins A and D. No. 3 ration was relatively poor in potassium and in vitamins A, C, and D. All the experimental rations were rich in phosphorus.

TABLE I.

Group.	Expt. 1.	Expt. 2.	Expt. 3.
1	Barley + turnip.	Barley + grass.	Barley + turnip.
2	Barley + turnip, 2 g.	Barley + grass, 0·5 g.	Barley 95 parts + turnip 1 part.
3	Barley 25 parts + salt mixture 1 part.	Same as in Expt. 1.	—

In view of the changes in the adrenals a number of unilateral-adrenalectomised cavies was included in all groups in Experiments 2 and 3. The left gland was removed in every case, because of the great operative difficulties in removing the right. Contrary to Sharpey-Schafer's statement (1924, p. 100) we were convinced that the deaths of the very few animals that succumbed could be attributed to some complication, avoidable or accidental, during the operation and not to removal of the gland per se. Autopsies were done on all animals, generally within an hour after death, whether natural or not, except on those that died during the night when several hours elapsed before examination was made. Sections were made of affected parts of the stomach and duodenum, the adrenals, and the thyroid.

Results.

In none of the non-operated control animals was any significant organic change observed. Sections of tissues from 15 of these were examined. The findings in the other groups are summarised in Table II.

TABLE II.

Expt.	Group.	No. of cavies.	Congestion, haemorrhage in mucosa of pyloric region.	Ulcer or erosion in mucosa of pyloric region.	Congestion, haemorrhages or ulcers of cæcum or colon.	Congestion, haemorrhage in adrenals.*	Excessive vacuolation of adrenals.*
1	2	10 N.	5	1	5	8	2
	3	10 N.	10	2	3	8	2
2	2	5 N.	4	0	0	1	2
	2	5 Op.	5	0	0	3	2
	3	5 N.	5	3	3	2	3
	3	4 Op.	2	1	1	3	0
3	2	2 N.	2	1	1	2	2
	3	6 Op.	5	3	0	2	3
	Total ..	32 N.	26	7	12	21	12
		15 Op.	12	4	1	8	5
	Percentages	N.	81	22	37	66	37
		Op.	80	27	7	53	33

N = Non-operated. Op. operated.

* In only six cases did circulatory disturbances occur along with abnormal vacuolation (three in Expt. 2 "N.," two in Expt. 3., "N.," and one in Expt. III., "Op.")

Operated Controls.—In the control groups there were eight unilateral adrenalectomised animals. Three of these showed congestion and hæmorrhage and three others excessive vacuolation of the adrenal cortex. Three of these six had numerous ecchymoses in the gastric mucosa, which were obviously not due to injury of the viscus during operation.

Experimental Animals: Alimentary Canal.—The congestive changes in the pyloric region were as described under the preliminary experiment. The erosions varied very much in degree. In one case an ulcer of the hepatic aspect of the duodenum had perforated, but the resulting abscess was localised. In the remainder the appearances varied from cases where only the surface epithelium was destroyed to others where only one layer of infiltrated muscle separated the lumen from the peritoneum. The superficial lesions were extensive and evidently acute; congestion, hæmorrhages, and degeneration of mucous membrane were their predominating features. The deeper lesions were more localised, but less congested than the superficial. Discrete ulcers with cellular infiltration of the surrounding tissues were the most conspicuous appearances in the subacute lesions, which were generally found only in the most long-lived animals. The ulcers varied in size from a speck, just visible, to a more or less circular area about 5 mm. in diameter. The edges were sloping and not punched out. In several cases, whether erosions or ulcers were present or not, the gastric and duodenal mucous membrane was unhealthy looking and peeled off very readily.

Without exception, animals that had lesions of the stomach or duodenum showed evidence of stasis in the cæcum and proximal colon, whether or not inflammation was present in these places. In some cases the cæcum was overloaded and atonic-looking, in others it was markedly sacculated. In both types the distal colon was generally contracted and cord-like, often containing bloody fæcal matter and casts. Variable amounts of foul-smelling gas were often present in cæcum and colon. Constipation was the rule in the late stages, but diarrhœa was frequent in the early stages, especially in Group 3.

Adrenals.—The changes in the adrenals were like those observed by McCarrison (1921, p. 170) except that the hæmorrhages were not confined to the periphery of the cortex, but occurred all over it, sometimes bordering on the medulla. The increased vacuolation was not confined to any particular zone, although in individual cases one zone was often more affected than others. Very often the entire cortex was involved. In normal animals vacuolation, when at all conspicuous, was confined for the most part to the zona glomerulosa. One may reasonably assume, in agreement with Cramer (1926), that the hyperæmia was evidence of increased activity of the gland and the hæmorrhage of excessive activity. The significance of the abnormal vacuolation was not so clear, and our procedure did not throw any direct light upon its nature—whether it was genuine and due to degenerative changes, or apparent and due to accumulation of lipoid which had been dissolved out by the balsam in which the sections were mounted (Cramer, 1918). This author regards the presence of cortical lipoid as a sign of functional activity and its absence as a sign of inhibition or exhaustion of the cortex, which, he suggests, is concerned in the secretion of adrenalin. The excessive vacuolation in our experiments appeared to be merely an exaggeration of the normal, and the regular outlines suggested vesicles full of non-staining material rather than degenerative changes. We are inclined to think, therefore, that the vacuolation was a sign of great activity, a view which is supported by the results in our own adrenalectomised controls and by the observation of Bast, Supernaw, and others (1928). They have recently found increased vacuolation of the cortex in rabbits subjected to prolonged nervous and physical stimulation. It is, therefore, probable that the conditions observed in the adrenals were indications of great or excessive functional activity.

Thyroid.—In the thyroid the only abnormal condition we could be sure about was hyperæmia of very varying degrees. In some cases the vesicles were small with scanty colloid and cubical epithelium (signs of activity); in others the vesicles were large and full of colloid and the epithelium was flattened (signs of diminished function). These conditions were probably not related to the deficient diets, because thyroids from normal animals showed much the same appearances. Changes in the histology of the thyroid have,

however, been observed as a result of deficient diets—Sharpey-Schafer (1924); Harris and Smith (1928); Murray (1923).

Discussion.

The disordered rhythm (as found in our physiological experiments), the alimentary stasis, the lesions in stomach, duodenum, and large bowel, and the changes in the adrenal are apparently all interrelated and caused either proximately or remotely by the deficient diets. A priori one would expect dysfunction of the bowel movements to be primary to the organic lesions. The fact that irregular rhythm was obtained in some cases showing little or no visible organic change strengthens this belief. The disorganised movements would presumably lead to stasis followed by putrefactive changes evoking abnormal sensory stimuli. These, in accordance with Carlson's opinion (1916), would induce pylorospasm, and in consequence hyperæmia of the parts and delayed emptying of the stomach. The signs and symptoms referable to the alimentary canal, observed in completely adrenalectomised animals by Biedl, Elliott, Vincent, and others, and more recently by Rogoff and Stewart, Swingle, and his colleagues, and others, point to a definite connexion between the function of the adrenals and of the alimentary canal. Rogoff and Stewart (1926, *a*) almost invariably found circulatory disturbances in the alimentary canal post mortem and often erosions or ulcers in the stomach or duodenum. They found the highest incidence of ulcers (7 out of 17 dogs) in adrenalectomised pregnant females, whose survival period was always many times longer than that of males or non-pregnant females. Rogoff and Stewart (1926, *b*), Banting and Gairns (1926) have also found similar ulcers in adrenalectomised dogs. Furthermore, Hartman (1924) has cited experiments by Weiskotten, who found hyperæmia and hæmorrhage of the adrenal cortex in patients dying from superficial burns. In such cases, as is well known, peptic ulcers of an acute type are common.

Cramer (1926) has suggested that products derived from intestinal putrefaction cause stimulation of the adrenals, an opinion which leads to consideration of the action of protein decomposition products—e.g., histamine on the adrenals. We are not aware of any experiments bearing directly on this point, but it has been shown by Dale (1920) and confirmed by Banting and Gairns (1926) and by Crivellari (1927) that the resistance of completely adrenalectomised animals to histamine is abnormally low. Dale has pointed out that a close similarity exists between the condition of the blood in adrenalectomised animals (lowered plasma content) and animals that have received large doses of histamine. The increased concentration of the cellular and of other constituents of the blood after adrenalectomy has been confirmed by Rogoff and Stewart (1926, *c*), Swingle (1926), and Hartman et al. (1927). The evidence, therefore, strongly suggests that the function of the adrenals is to antagonise the action of histamine and probably of similarly constituted substances. Furthermore, it is interesting to note that McIlroy (1928) has recently produced peptic ulcers in cats by large injections of histamine with and without previous local experimental trauma. These considerations have led us to think that excessive intestinal putrefaction is causally related to spasm of the pylorus and to adrenal exhaustion, and that the latter, as well as the former, is a factor in the production of circulatory disturbances in the stomach and duodenum. If acute these conditions apparently cause death without any marked degenerative change; if subacute they apparently cause ulceration of a chronic type. Ulcers in the pyloric region or congestive or degenerative changes have been observed by Rowlands (1927), and by Underhill and Mendel (1927) as well as by McCarrison, as a result of diets deficient in various vitamins. It would seem, therefore, that deficiency of vitamins was the factor of greatest importance in the production of the lesions found in these experiments. The deficient diets used by us, however, were badly balanced in regard to several important inorganic constituents as well as being poor in vitamins. It is fairly certain also that many of McCarrison's diets, which induced organic changes in the pyloric region in cavies and monkeys, were poor in inorganic elements. It is therefore unwise to attribute the lesions observed by us to one or other of these factors only.

As these experiments proceeded we became more and more convinced of our inability to interpret the significance of many of the results obtained, especially those of a physiological nature. We therefore felt it desirable to postpone work on the effects of inadequate diets until our knowledge of the fundamental characteristics of smooth muscle was sufficiently far advanced to permit of more precise inferences. The experiments published here are therefore somewhat incomplete, but it is hoped that they will throw some light on the problem they were planned to elucidate. We fully realise, however, that derangements of other functions or of other tissues, not considered in this paper, probably also contribute towards the production of peptic ulcers.

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SEVERE ANÆMIA OF PREGNANCY AND THE PUERPERIUM.

WITH A REPORT OF TWO CASES.

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INVESTIGATION of the records of 1913 labours conducted at Queen Charlotte's Maternity Hospital in 1926 and of 2170 labours in 1927 failed to disclose a single case of severe anæmia of pregnancy and the puerperium. Reference to the literature also proves that the disease is uncommon. These facts alone render unnecessary any apology for placing the present cases on record.

The condition was first described in 1842 by Channing,[1] an American obstetrician, who distinguished it from anæmia resulting from hæmorrhage. He reported ten cases, all terminating fatally. Osler [2] classified the severe anæmias of pregnancy and the puerperium under four headings: (1) anæmia from post-partum hæmorrhage, (2) the severe anæmia of pregnancy, (3) post-partum anæmia, and (4) the acute anæmia of post-partum sepsis. He considered the anæmia in groups (2) and (3) to be the result of hæmolytic agents produced in the changed metabolism of pregnancy or in the katabolism of the post-partum state. Rowland,[3] reporting two cases in America, assumed that a syncytial hæmolysin is produced in the ectodermal cells of the chorion during pregnancy, and that later an antihæmolysin is found in the maternal blood; failure in the formation of this substance results in persistent anæmia. Smith [4] in America recorded eight cases. He considered adminis-

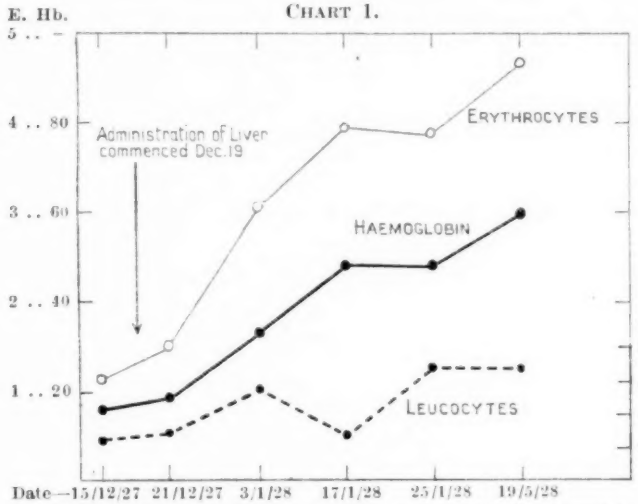
tration of dilute hydrochloric acid to be of distinct value in the treatment, and its deficiency to be a probable ætiological factor. In 1925 Larrabee,[5] of Boston, cited 17 cases. The blood picture in eight resembled that found in pernicious anæmia, in seven it simulated a secondary anæmia, in one it was atypical, and in another the condition resembled aplastic anæmia. He suggested achlorhydria as the main ætiological factor. Hoskin and Ceiriog-Cadle [6] reported a case which closely simulated Addisonian anæmia. They regarded as predisposing factors achlorhydria and general debility before pregnancy. Neale [7] in this country reported two cases in 1927. In one of them sepsis of the cervix uteri was present. Murdock,[8] in a paper recording two cases, pointed out that little or nothing was known of the ætiology of the disease. McSwiney [9] in India studied the condition in 43 patients. He found that it occurred in 1·69 per cent. of all pregnancies and is much commoner in early than in late pregnancies. The maternal mortality was 35 per cent. and the fœtal mortality 56 per cent. Multiple pregnancy, which occurred in three cases, he considered to be amongst the predisposing causes. The Wassermann reaction proved to be positive in eight cases out of 20—i.e., 40 per cent. Balfour,[10] reporting 150 cases investigated at the Bombay Clinic, found the disease more prevalent amongst Mohammedan than Hindu women. The illness usually commenced between the sixth and seventh month of pregnancy and was ushered in by fever, with or without diarrhœa. Enlargement of the spleen was detected clinically in 18 per cent. of cases. Albuminuria was common.

The Two Cases Described.

CASE 1, aged 29, was admitted to the London Hospital on Dec. 15th, 1927, under the care of Dr. Theodore Thompson.

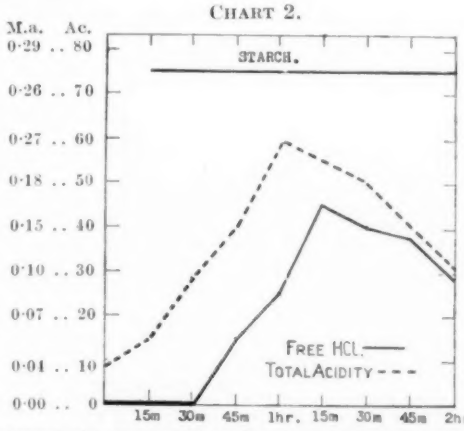
History.—The birth of her first child eight years previously occasioned no trouble. She remained well during the second pregnancy, which resulted in the birth of a full-term baby weighing 8¼ lb. There was no excessive bleeding and no laceration of the perineum. The first child was then 15 months old. Immediately after delivery she complained of pallor, shortness of breath, great weakness, and swelling of the feet. She gradually got better. Three years ago, during the latter half of her third pregnancy, she complained of extreme and increasing pallor, great weakness, and shortness of breath. There was no fever nor diarrhœa, and the feet were only slightly swollen. The labour was uncomplicated, a full-term child was born, and the patient again gradually improved. During the second month of her fourth pregnancy she complained of weakness, shortness of breath, swelling of the feet and legs, palpitation, and increasing pallor; her friends remarked that she was "yellow." There was never any fever, diarrhœa, or vomiting. The symptoms progressed until the eighth month, when the onset of premature labour terminated the pregnancy. There was no excessive bleeding and the perineum remained intact. The symptoms persisted and she applied for admission to hospital one month after confinement. All four children were said to be healthy and thriving.

CHART 1.



Indicating progress in Case 1, as shown by successive blood counts.
E. = Erythrocytes per c.mm. in millions.
Hb. = Percentage value of hæmoglobin.
L. = Leucocytes per c.mm. in thousands.

CHART 2.



Record of gastric acidity values in Case 2, as determined by analysis of the fractional test-meal.
M.a. = Percentage of mineral acid calculated as HCl.
Ac. = Acidity of 100 c.cm. in terms of c.cm. N/10 HCl.

On examination the patient, a moderately well-nourished woman, appeared very weak, tired, and hardly able to move. She was extremely pallid, the skin being a deep buff colour. The mucous membranes were pale but jaundice was absent. There was no dental sepsis; the tongue was slightly furred. Temperature ranged from 97° to 99° F., and the pulse was of normal rate and rhythm. The blood pressure was 125/80. A hæmic murmur was heard in the pulmonary area. Examination of the lungs and central nervous system disclosed no abnormality. Retinoscopy proved the fundi oculi to be normal. The spleen was easily felt during deep inspiration; the liver was not enlarged. There was gross œdema of the feet and legs. The pelvic organs were normal and there was no vaginal discharge. A trace of albumin was found in the urine, but at subsequent examinations it was clear. There was no evidence of hæmorrhoids. The Wassermann reaction in the blood-serum was negative. The Ewald test-meal demonstrated absence of free hydrochloric acid, the total acidity value being 8. The fractional test-meal also demonstrated achlorhydria throughout. There was no abnormal fragility of the red blood corpuscles. Van den Bergh's test gave a negative direct reaction; the indirect reaction was weakly positive, showing presence of 0·7 mg. of bilirubin per 100 c.cm., equivalent to 1·4 units. There was slight excess of urobilinogen in the urine. The blood, tested for hæmolysis and agglutination, was found to belong to Group 2. The blood count taken on Dec. 15th, 1927, showed poikilocytosis and anisocytosis; erythrocytes, 1,200,000 per c.mm.; hæmoglobin, 16 per cent.; colour-index, 0·57; leucocytes, 2610 per c.mm. The differential white cell count showed: polynuclear neutrophils, 70·5 per cent.; polynuclear eosinophils, 3 per cent.; large hyaline cells, 3 per cent.; small lymphocytes, 19·5 per cent.; large lymphocytes, 3·5 per cent.; coarsely granular basophilic cells, 0·5 per cent.

Treatment.—Blood transfusion was considered inadvisable. An iron mixture was prescribed and daily injections of sodium cacodylate, gr. ½, were given. On the fourth day after admission liver treatment was commenced. This consisted of ½ lb. of fresh liver, finely minced, to which had been added orange juice and sherry. This preparation was given twice a day. Her condition rapidly improved and she was feeling well when she left hospital on Jan. 26th, 1928. She was next seen on May 19th, 1928, when there had been no recurrence of symptoms and she appeared in normal

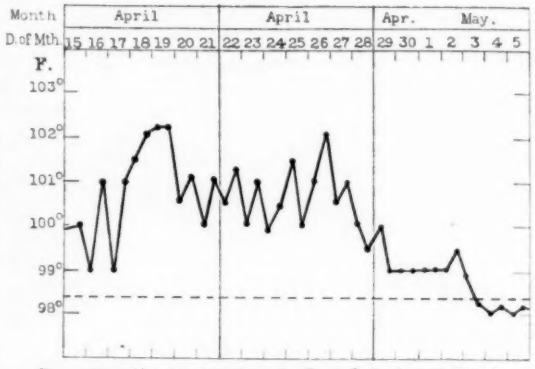
health. There was no œdema of the feet, but the spleen still remained easily palpable on deep inspiration. A blood count showed slight poikilocytosis and anisocytosis; erythrocytes, 4,700,000 per c.mm.; hæmoglobin, 60 per cent.; colour-index, 0·64; leucocytes, 6800 per c.mm. The patient was last seen on Sept. 8th, 1928, and appeared quite well. The intermediate blood counts in this case are recorded in Chart 1.

CASE 2, aged 32, was admitted to the London Hospital on April 15th, 1928, under the care of Dr. Theodore Thompson. Her first child was born nine years ago. She remained well during the pregnancy. There was delay during the first stage of labour, and delivery was aided by forceps; the puerperium was free from complications. Her second child was born two years later, the birth being followed by onset of pallor, weakness, and flatulence. The patient was given 25 injections for anæmia and remained in bed for three months. She had been unable to take medicine by mouth on account of indigestion. When her second child was 5 years old, the patient, who was then three months' pregnant, had a miscarriage; the medical attendant informed her it was a twin pregnancy. She was not anæmic at the time and remained in good health. For years she had suffered from painful hæmorrhoids, but bleeding had never been severe. In February, 1928, the patient, then seven months' pregnant, became very weak, pale, and short of breath, and noticed that her feet were swollen. She complained that her mouth was dry and her tongue very sore. There was no fever and no diarrhœa. On April 8th, the pregnancy terminated three weeks prematurely. The labour was easy and uncomplicated, and there was no excessive loss of blood. She became progressively worse and was sent to hospital. On the day before admission she had epistaxis, which was easily controlled. The three children had remained well and healthy.

On examination the patient was drowsy and apathetic, and when roused spoke or muttered incoherently, her cerebration being slow and her speech deliberate and often disconnected. Her respiration (28 per minute) was sighing in character and accompanied by conspicuous movement of the alæ nasi. She was extremely pallid and profoundly anæmic; her lips were almost colourless. The skin was of a deep buff colour. There was intense pallor of the mucous membranes but no jaundice.

Temperature was 100° F. on admission and during the first three weeks in hospital there was continuous or remittent pyrexia (see Chart 4). The tongue was dry and furred; the teeth showed no sepsis. The pulse (110 per minute) was regular and of fair volume, and the blood pressure was 130/90. A hæmic murmur was heard in the pulmonary area. There was gross œdema of the feet and legs. The fundus uteri reached to the upper border of the os pubis. The spleen was not felt. No abnormal physical signs were found in the lungs and the central nervous system. Retinoscopy showed normal fundi. The lochial discharge was normal in amount and colour, but offensive. On vaginal examination the uterus was found to be slightly enlarged, a finding consistent with the presence of some degree of subinvolution. Rectal examination revealed external and internal hæmorrhoids; there was no bleeding. A catheter specimen of urine was acid, with a specific gravity of 1015, and contained a trace of albumin and no sugar. A small deposit consisted of a few red cells, leucocytes, and epithelial cells; there were no casts present; culture grew *Staphylococcus albus*. There was no diarrhœa and the stools were normal.

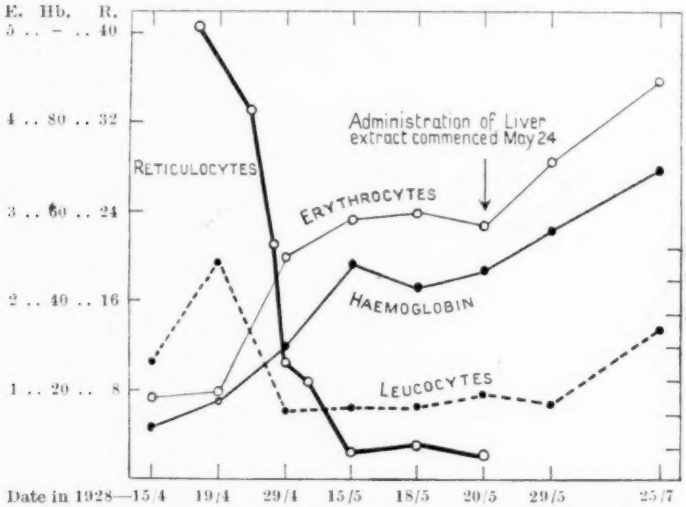
CHART 4.



Recording the temperature in Case 2 during the first three weeks in hospital.

The Wassermann reaction in the blood-serum was negative. The blood-serum calcium was found to be 9·2 mg. per 100 c.cm. The blood culture was sterile. The fractional test-meal (see Chart 2) demonstrated the presence of free hydrochloric acid in normal concentration in the gastric contents. The blood, tested for hæmolysis and agglutination, was found to belong to Group 4. Hæmolysis of the red cells ceased at 0·5 per cent. concentration of sodium chloride. The van den Bergh test gave a negative direct reaction; the indirect reaction was feebly positive, showing the presence of 1 mg. of bilirubin per 100 c.cm., equivalent to 2 units. There was no excess of urobilinogen in the urine. The blood count, taken on April 15th, 1928, showed a severe degree of poikilocytosis, anisocytosis, and polychromatophilia; erythrocytes, 900,000 per c.mm.; hæmoglobin, 12 per cent; colour-index, 0·7; 1 normoblast, 1 megaloblast, and 3 microblasts were seen in counting 200 white cells; leucocytes, 7000 per c.mm. The differential white cell count was as follows: polynuclear neutrophils, 61·5 per cent.; polynuclear eosinophils, 2 per cent.; small lymphocytes, 14 per cent.; large lymphocytes, 1 per cent.; large hyaline cells, 11·5 per cent.; transitional neutrophils, 2·5 per cent.; myelocytes, 7 per cent.; myeloblasts, 0·5 per cent. The erythrocyte and leucocyte count, the hæmoglobin content, and the colour-index, as well as the reticulocyte count, as found at subsequent examinations of the blood, are recorded in Chart 3. The blood count taken on April 19th, 1928, demonstrated extreme poikilocytosis, anisocytosis, and polychromatophilia; 24 normoblasts and 4 microblasts were seen in counting 200 white cells; myelocytes and myeloblasts were also present. In subsequent blood counts no primitive red cells nor white cells were seen.

CHART 3.



Illustrating progress in Case 2, as shown by successive blood counts.
E. = Erythrocytes per c.mm. in millions.
Hb. = Percentage value of hæmoglobin.
R. = „ „ „ reticulocytes.
L. = Leucocytes per c.mm. in thousands.

Treatment.—On April 15th the patient was given liver prepared in the same way as that given in Case 1, but she vomited after each administration. Two days later a preparation of liver extract was given, but this also induced vomiting and was discontinued. As in Case 1, blood transfusion was considered dangerous in view of the grave degree of anæmia. The patient, however, made fair progress on general treatment, as shown by Chart 3. From April 29th to May 20th her condition remained stationary, and it was on the latter date that liver extract

(Boots), one phial twice a day—i.e., equivalent to 1 lb. of raw liver daily—was given and tolerated. The result was most favourable, the patient making a rapid and uninterrupted recovery. Re-examined on July 25th she appeared in perfect health and had remained free of symptoms. The same good progress had been maintained when she was last seen, on Sept. 8th, 1928.

Observations and Conclusions.

As in pernicious anæmia, so also in the severe anæmia occurring during pregnancy and the puerperium, the true ætiology of the condition still remains obscure. That achylorhydria is a prominent ætiological factor is not borne out by Case 2, as the fractional test-meal showed free hydrochloric acid in the gastric contents in normal concentration (see Chart 2). It is known [11] [12] that in anæmia following hæmorrhage or due to some other cause, a state of achlorhydria may be established as a secondary factor, being the result rather than the cause of the anæmia. Similarly the absence of free hydrochloric acid in Case 1 may have resulted from the severe anæmia present at the two previous confinements. The theory that the condition is due to syphilis cannot be seriously entertained; in neither of the cases reported here was there any history of syphilis, and the Wassermann reaction was negative in both. That there exists in patients suffering from the disease a natural predisposition to anæmia is difficult to dispute; but inquiry into the past history of the present cases proved that from childhood onwards they had both been perfectly healthy and had never previously suffered from anæmia.

The condition simulates Addisonian anæmia in many respects; thus in both instances there may be a great reduction in the erythrocytes, the presence of primitive red cells, an increase in the reticulocyte count, the presence of slight splenic enlargement, and finally the beneficial response to liver therapy. In both conditions, also, the established anæmia appears to be primarily dependent on the failure of the primitive cells in the bone-marrow to differentiate into the mature erythrocytes. Abnormal metabolites formed during the disturbed metabolism of pregnancy would appear to be the cause of the failure in the condition considered here. In cases reported in the literature a deposit of free iron was discovered in the various organs at autopsy. Investigations of the two cases reported here fail to give evidence of the existence of a hæmolytic agent. Jaundice was absent in both cases, and the van den Bergh indirect reaction was only very feebly positive. There was only a very slight excess of urobilinogen in the urine in Case 1 and no excess in Case 2. It will be noted that in both instances the hæmoglobin content was very markedly reduced. Hæmorrhage and sepsis are excluded as possible ætiological factors in both cases.

Each case illustrates how the anæmia, once established, tends to recur in later pregnancies, anæmia of a severe degree being present at the second, third, and fourth confinements in Case 1, and in the second and fourth in Case 2, both patients remaining well between the attacks. Furthermore, the anæmia may become more pronounced and its onset earlier during each successive pregnancy. Both patients were young, and the anæmia in each case followed the birth of the second child. When the anæmia becomes established during pregnancy, premature labour is the rule.

Although many cases recorded in the literature have terminated fatally, the prognosis is good, the disease having a natural tendency to recovery after parturition. Furthermore, as this investigation has established, the outlook is greatly improved by the immediate beneficial response to liver therapy. Charts 1 and 3 indicate the good progress made by both patients after the administration of liver. With such a remedy in our hands it becomes important to recognise this rare condition in its initial stages and to commence treatment before the onset of labour.

I am greatly indebted to Dr. Theodore Thompson for permission to publish the cases, and to Dr. P. N. Panton, Director of the Hale Clinical Laboratory, for the various tests employed in the investigation of both patients. I wish also to thank Dr. E. G. Frewer for his help in the investigations.

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Clinical and Laboratory Notes.

FOUR CASES OF APPENDICITIS SIMULATING OTHER DISEASES.

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SINCE the days when appendicitis was termed typhlitis or perityphlitis, and treated medically, great advance has been made in our knowledge of this condition. It is extremely seldom now that cases of acute appendicitis are left undiagnosed until their chances of recovery have been gravely prejudiced. Cases of subacute appendicitis with recurring attacks of colic are also usually operated on before they can become the cause of any considerable lasting damage to health. Nevertheless, the appendix can prove a most subtle and deceptive adversary, disguising itself under the symptoms of some other complaint, or causing symptoms so slight that they do not alarm the patient and often cause no great worry to the practitioner, unless he has made a very searching examination.

The pitfall of mistaking a subacute appendix, with recurring attacks and intervals of quiescence, for a duodenal ulcer is now generally appreciated and guarded against, but even yet it often happens that a chronic appendix in its later stages is erroneously diagnosed as tuberculosis, cancer, or some other wasting disease. A chronic appendix of long standing can cause as marked a cachexia as tuberculosis or a neoplasm, and it is very doubtful whether we diagnose it often enough during this phase. This is because the main complaint is often of weakness, lassitude, and loss of weight, and it is frequently only after a very searching inquiry that we learn that the patient has suffered from a "weak digestion" for a long time. This paper is based on cases seen at the Hertford British Hospital during the past six months. We are reporting four of the most striking cases which were sent to hospital wrongly diagnosed, but we have seen several others which, although correctly diagnosed when sent to hospital, had been treated for a considerable time—two of them for years—as other entirely different diseases.

CASE 1.—A woman, aged 28, was sent up to the out-patients' department with a diagnosis of cancer of the large intestine. For five days before admission she had vomited after every meal, the vomit being sour and copious. She had no definite pain anywhere, but suffered from a dull, heavy, uneasy feeling in the region of the umbilicus. She had never had a good digestion, and could remember being subject to attacks of vomiting even as a girl at school. As far as she could remember, this vomiting had never been

accompanied by any marked pain, but she often suffered from indigestion after meals. Four or five years ago she had been diagnosed as a pernicious anæmia, but a blood-film later disproved this. Her indigestion had become worse during the last two years, and eight months before admission she had been confined, since when she had been losing weight rapidly. She was very constipated and had been so for many years.

On examination she was anæmic and very cachectic, with sallow and putty-coloured skin. Her mouth was very sore, with small ulcers all over its mucous surface; the tongue was dry, furred, and extremely sore. The temperature was 97° F., the pulse-rate 120, and the pulse was soft and running. The subcutaneous fat had nearly all disappeared from the abdomen and the skin had lost practically all its elasticity. No tumour, apart from fæces in the descending colon, could be found. There was generalised abdominal tenderness on deep pressure, and over McBurney's point this tenderness was especially marked. The muscular resistance of the lower part of the right rectus was increased. An olive oil enema produced a good result, both flatus and large, hard constipated scybalæ being passed. The heart sounds were weak and of a fœtal rhythm; there was a hæmic murmur and pulsations in the neck. The white blood count was 15,000, and a test-meal revealed no free hydrochloric acid in the stomach. The patient was very toxic and it was impossible to undertake any operation until the general condition, and especially the state of the heart muscle, had been improved. She had been suffering from cardiac attacks for three weeks before admission, and two days after her arrival she died from syncope.

Post-mortem Findings.—Autopsy revealed a chronically inflamed appendix about 6½ inches long, with many adhesions between it and the cæcum. It was patent throughout its length and contained four small concretions. There was no neoplasm in the abdomen or pelvis. The kidneys showed microscopic chronic interstitial changes. The liver was in a state of fatty degeneration. The heart valves were competent but the microscope revealed much fibrous tissue in the musculature. The cause of death was obviously a severe toxæmia due to chronic app ndicitis, the final stage being toxic myocarditis and heart failure.

According to her history this appendix had remained undiagnosed for a considerable number of years, probably since she was a girl at school. Indigestion had thus come to be an accepted feature of her life, and she did not think it worth while to consult a doctor about it. When she finally did ask advice about her general health too much importance was apparently attached to her general symptoms and not enough to her local ones, with the result that the possibility of an appendix was overlooked, and first pernicious anæmia and later cancer was suspected. Her confinement eight months before admission had overtaxed her already undermined health. It was the proverbial "last straw." She lost weight rapidly, had a constant uneasiness in the epigastrium, vomited after meals, and was so constipated that fæcal lumps in the large intestine could be felt through the abdominal wall. She had the cachectic sallow look so commonly associated with neoplasms, and superficially the clinical picture was very much like that of cancer.

There were, however, indications of a chronic appendix rather than of a malignant tumour. The long unbroken history of digestive disturbance is rather against cancer, for she began to have trouble about 15 years before admission and did not markedly lose weight until after her confinement. Again, she was rather young for cancer, although, of course, cancer cannot be ruled out by age. The leucocytosis (15,000), the quick soft running pulse, the definite tenderness over McBurney's point, and the increased muscular resistance in the right iliac fossa, pointed clearly to a chronic appendix, and these signs must have been there, waiting to be recognised, for some time.

CASE 2.—A young woman, aged 29, sent in as a pulmonary tuberculosis, complained of cough, with much sputum, lassitude, sleeplessness, headaches, and lack of energy. She had always been delicate, even as a child, and had lately become extremely nervous. She volunteered no further information, but closer questioning revealed that she had suffered from "biliousness" since her youth, and when she started work she adopted the unhealthy and irregular dietary which is unhappily all too common among typists. Her lunch consisted of tea and buns at a café, and when she returned at night she was usually too tired to bother to prepare a meal, and contented herself with more tea and some bread and cheese. Her sleep was very disturbed and she awoke in the morning unrefreshed, drank a cup of coffee, ate a roll, and went to the office, thus completing the vicious cycle. She was habitually constipated, and at times complained of severe pains around the umbilicus and in the right iliac fossa. Lately she had developed night sweats and a cough with scanty frothy sputum. For the past two months she had suffered from amenorrhœa. She had had heart trouble due to rheumatic fever since she was a child. She went to a doctor who diagnosed tuberculosis and sent her to hospital.

She was painfully thin and very anæmic. Her tongue was furred, her breath fœtid, and her teeth bad. Her temperature was 98·2° and her pulse-rate 110 per minute. Her chest expanded equally on both sides; there were coarse crepitant râles in both bases, but no dullness on percussion. Nothing else abnormal was found. There was a double mitral murmur. The white blood count was 22,000. X ray showed the usual marling at the bases, common in all city dwellers, but nothing else abnormal. No tubercle bacilli were found in three examinations of the sputum. There was marked diminution of subcutaneous abdominal fat, and loss of elasticity of the skin. On palpation we found slight generalised tenderness over the whole abdomen, slightly more marked over McBurney's point. The muscular resistance of the right rectus was slightly increased. Per rectum there was no tenderness. After she had been in hospital two days she developed an unmistakeable attack of appendicular colic. The urine contained albumin.

It was first of all necessary to treat the bronchitis, which cleared up in four days. Operation revealed a large, red, retro-cæcal appendix, covered with white flaky deposits of lymph. There were many firm adhesions between the appendix and cæcum. The lumen was patent throughout its length, the mucous membrane being very swollen and unhealthy. There was a large concretion at its tip.

Since operation the patient has never complained of any more pain in the stomach, her cough has never returned, and she has put on weight. Her teeth have been attended to, her dietary corrected, her colitis is being treated, and she is feeling much better. She does not get so tired, though her heart still causes her distress when she overexerts herself.

In cases which present symptoms very similar to those of tuberculosis, but without any characteristic signs or X ray appearances, it is, we think, prudent to bear the appendix in mind and thoroughly interrogate and examine the patient. In this case, as in the majority, the mistake in diagnosis was due to incomplete examination. Without close questioning she did not mention her digestive symptoms, and without these the case certainly resembled pulmonary tuberculosis. However, after the bronchitis had yielded to treatment we were left with nothing abnormal in the chest, and while under observation she had an attack of appendicular colic, so that the diagnosis was made clear.

CASE 3.—A man, aged 34, sent in as a duodenal ulcer, had been ill for two years before admission. He suffered from intermittent attacks of boring pain in the epigastrium. The pain radiated through to the back. The interval between the attacks was originally two or three months, but for two months the pain had been continuous and woke the patient from sleep. It came on about an hour after each meal and continued until the next. He never vomited though he had suffered from nausea, which had become worse. Diet at first relieved the pain, but later failed to do so. There was no history of melæna, waterbrash, regurgitation of acid, or a bad taste in the mouth, but the patient suffered continually from flatulence. He was slightly constipated and had lost weight. During the preceding year he had been diagnosed as a duodenal ulcer and dieted; he improved, but became worse again immediately the treatment was stopped.

He was very thin and had a gastric expression. His teeth were good. His tongue was moist and lightly covered with white fur. The abdominal wall was very muscular, but subcutaneous fat had largely disappeared from under the skin. There was marked tenderness in the epigastrium in the mid-line, just under the costal angle, and slight tenderness over McBurney's point, but none over the gall-bladder or per rectum. The liver was not enlarged. The urine contained bile for three days after admission. X ray of the stomach showed a stenosis at the pylorus, and an irregularity in the outline of the greater curvature; the latter we attributed to gas. The meal was rapidly evacuated from the stomach and small intestines, and was all in the lower coils of the ilium and the cæcum in four hours. He was kept on large doses of belladonna for one week and

then X rayed again; the same stenosis of the pylorus was present, but there was no irregularity in the greater curvature.

The diagnosis lay between a pyloric ulcer and a subacute appendix, and therefore at operation we employed a right lateral incision, which enabled us to examine both these organs. The stomach was found to be absolutely normal, but the appendix was retro-cæcal, and very congested and inflamed. It was removed and found to contain a large concretion. Since the operation (five months) the patient has had no more illness.

Sir Berkeley Moynihan [1] has said:—

"More mistakes are made in a diagnosis of gastric ulcer than is the case in any other abdominal disorder. The stomach is an organ full of sympathy for other sufferers, and it speaks so loudly that its voice only is heard. We cannot rid the matter of error until we realise how very difficult the diagnosis of gastric ulcer really is, and until we decide that, no matter how confident the clinical diagnosis may be before operation, it shall not guide us during the operation too firmly."

The possibility that this case was an appendix was appreciated, but the radiographic appearances and the clinical picture kept the diagnosis in doubt right up to the time when the abdomen was opened. It would be well if, before a definite diagnosis is made of gastric or pyloric ulcer—comparatively rare complaints—the commoner abdominal disturbances, such as appendicitis and cholecystitis, were always excluded.

CASE 4.—A man, aged 57, had been treated for neurasthenia in various nursing homes for over four years before admission, and on one occasion had undergone Weir Mitchell treatment for three months. He complained of a "depression in the stomach which flew to his head." Questioning revealed that by the word "depression" he meant "a pain which left him weak." This affected him at any time and bore no relation to meals, although certain highly spiced or very rich meats would bring it on. He never vomited during these attacks of pain and had not lost weight. Lately he had become afraid of people, even members of his own family, because he thought they would upset his temper and thus cause his pain. He had been very constipated for many years. He had been unable to concentrate on his work, and had suffered from sleeplessness and bad dreams.

He was a well-nourished man, not of the nervous type. His temperature was 98° and his pulse-rate 79. His tongue was furred, but his teeth were good. Nothing abnormal was found in the chest. There was plenty of subcutaneous fat on the abdomen. The patient was very defensive, and a good deal of persuasion was required before we could examine him. He was definitely tender over McBurney's point and there was increased muscular resistance on the right side. The white blood count was 26,000, and nothing abnormal was found in the urine. A bismuth meal revealed nothing abnormal, but on palpation under the screen it was seen that the tenderness was localised to a definite point in the cæcum (presumably the root of the appendix).

At operation a long, patent, chronicr ly inflamed appendix was removed. There were many ad' esions between it and the cæcum. When opened it was seen to contain very thick mucus mixed with fæcal particles; the mucous membrane was œdematous and unhealthy.

Since operation (three months ago) the patient has complained of no more pain and no more nervous symptoms. He is being kept on a diet for his colitis.

The diagnosis of neurasthenia in this case must have been due to failure to make a complete and careful examination. The patient had many neurasthenic symptoms but a chronic appendix was the beginning of his trouble. He was not, however, the type of man to accept indigestion as an everyday feature of his life. He had never had it before the age of 53, and, as prolonged treatment failed to cure it, the pain "got on his nerves." He would wait for it and live in daily dread of it. It is worthy of note that if a man of 50 complains of persistent indigestion for the first time in his life, it is very seldom that no organic cause can be found, and neurasthenia should be the last diagnosis. Before any man, young or old, is treated as a nervous dyspepsia the appendix should be absolutely excluded. A white blood count is often very helpful in pointing to the existence of inflammation, and it is probably not done often enough.

All these cases emphasise the need of a thorough and careful examination of every patient, no matter how trivial his complaint may seem. First impressions, though lasting, are not always correct; therefore let us avoid them.

[1] Brit. Med. Jour., 1919, ii., 765.

REMARKS ON COLONIC LAVAGE.

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A YEAR ago Dr. Chalmers Watson and Dr. P. De made a communication to THE LANCET [1] entitled Unrecognised Toxic Substances in Human Fæces. This paper, which was stated to be frankly provocative, was read before the Medico-Chirurgical Society of Edinburgh, when Dr. Watson invited commentary from practitioners whose independent observations of facts brought under their notice, he said, would be useful. Thus encouraged, I venture to publish some notes upon colonic lavage in particular relation to Dr. Watson's remarks upon the more than occasional confusion among medical men and nurses as to what may constitute normal fæces and what the evidence may be of an elementary toxæmia. His reflections here are practically concerned with colonic lavage, and during the 12 months that have elapsed since Dr. Watson's paper was read in Edinburgh I have taken notes of certain patients and have also availed myself of opportunities to see the technique employed at various centres.

Colonic lavage as a means of treatment, and to some extent as a means of diagnosis, is becoming more employed in this country—that is common knowledge; and if it is not used so extensively as in America and in Germany, that is perhaps partly because the treatment is with us very often left in the hands of unqualified persons who are not all equally capable of understanding either the reasons for the procedure or the results of the lavage. There have been articles written in lay and semi-medical publications in this country which have described the procedure. These articles have sometimes gone so far as to attribute to conditions of the large intestine the degenerative changes which are associated in a natural way with old age; consequently that big proportion of the population that wishes to stay youthful has concluded that any method of removing toxic waste products from the bowel and changing the intestinal flora may meet their object. The result has been that in this country colonic irrigation has run a risk of not taking its right place in scientific procedure, while—and this is serious—the treatment is administered too often by unqualified people whose results may easily fail to give satisfaction, and so discredit the procedure. Especially is this so because the lay agent almost naturally regards the washing out of the colon as the whole treatment of the case, whereas it is only a mechanical aid to general therapeutics. It is not profitable to send a patient suffering from auto-intoxication or even constipation to have lavage now and again, for while general symptoms may thus be relieved the cause of the condition will not be removed. This will be known to the qualified practitioner, and will be discovered by the patient, but many who administer lavage will consider that with a temporary relief success has been achieved. When the treatment is administered upon qualified advice precautions will be taken to see that there is no source of sepsis in teeth and mouth, pharynx, tonsils, or nasal channels, which would provide a continuance of the infection. Cases which had already been submitted to lavage I have found to remain substantially unaltered because the conditions of the intestinal

[1] THE LANCET, 1928, i., 174.

flora have not been recognised, and no attempt has been made to meet them by diet and acidophilous therapy.

Indications.

Colonic lavage is described in text-books, especially American ones, in sections upon the treatment of chronic constipation, and in such cases, although it does good to remove stale fæces, permanent improvement is not established by merely emptying the colon. The cause of the constipation must be ascertained, the proper diet arrived at by trial and expert massage, and graduated abdominal exercises must accompany the treatment. It is hardly too much to say that the most important part of a colonic irrigation treatment is usually the accompanying massage, for only through massage can the general tone of the colon be improved, while from the patient's point of view this measure has the advantage that they can be taught to massage themselves, a procedure that would usually only occupy some 20 minutes every morning. Colonic irrigation with accompanying massage, and instruction about exercise, will be of value only if the removal of any septic foci that can be detected is insisted upon. Then the following common conditions, perpetual headache, "biliousness," flatulence, and many signs of indigestion and constipation will be removed, but the lavage must be employed in the right way and at the right time. The same may be said in regard to many forms of colitis and many manifestations of so-called rheumatism, of gout, sciatica, and neuritis, things which were mentioned by certain of the speakers at the conference this summer in Bath on Rheumatic Diseases and put forward by Sir George Newman in his Presidential Address.[2] In Germany, in so-called rheumatic cases, where the discovery of the septic focus is in question, it is usual to examine the results of a lavage to ascertain how far the intestine may be mechanically at fault, the procedure not excluding bacteriological examination. These cases make up a large group in a general medical practice; in many of them temporary relief will be obtained promptly by lavage, but if permanent removal of the disability is to follow treatment considerable general care of the patient must accompany the procedure. In more serious diseases colonic lavage can only be looked at in the light of a general health measure. Many mental conditions, and some forms of asthma, may derive great temporary benefit in this way, and particularly in certain subjects lavage of the colon makes a difference to the sense of well-being that may manifest itself in circumstances of physical or mental strain; but I am not advocating the use of what properly employed is an important therapeutic measure as a temporary dope. On the other hand, of those who might say that to recommend as a general health measure a procedure that is not natural—namely, washing out of the colon—I would ask how many people in crowded communities or taking part in the usual social intercourse of to-day do lead natural lives?

Method.

Since the publication of Dr. Watson's paper I have looked into various methods of colonic irrigation that are commonly employed, and it is clear that they vary so much that the amount of benefit obtained from them must vary also. Visits were paid to various health resorts—Plombières, Harrogate, and Bath among them—and at clinics every opportunity was given to me of observing the technique. The quantity of fluid used was not constant, the amount ranging from one to as much as five or six pints; the sterilisation of apparatus was more carefully attended to at home than abroad; the rapidity with which injections were given was very different in different clinics; nor was the height of the containing cylinder determined by any fixed rule. The variations I could understand to be right, but only if the reasons for them could be seen to be related to particular cases. My own procedure, unless a practitioner in charge of the case desires me to vary it, or unless there are other and particular indications, is to give a quarter of an hour's massage and two douches of two and a half pints each, with variations of the douche to suit the requirements of the case.

I wish to advance the following points: (1) Colonic lavage should be done under the direct supervision of a qualified practitioner. (2) The amount of fluid used must vary according to the capacity of the patient, and the fluid should be used as slowly as possible to avoid dilating the colon, but to make any fixed rules in the matter is wrong. (3) The actual fluid used can be varied according to the symptoms of the patient—there are stimulating and there are soothing douches which can be employed in accordance with the conditions. (4) The value of colonic lavage is not obtained when it is only employed as a temporary measure, and by itself, to relieve some symptoms that are often self-diagnosed. Its real value is seen when it forms part of a general treatment in connexion with massage and appropriate diet, and when it is directed upon medical lines towards definite therapeutic objects.

[2] THE LANCET, 1928, i., 981.

SUBMUCOUS INJECTION OF HÆMORRHOIDS WITH QUININE UREA HYDROCHLORIDE.

BY CHRISTOPHER HOWARD, M.R.C.S. ENG.

THIS method of treating hæmorrhoids was brought before the medical profession at large by the publication, in France, of an article[1] by Dr. Bensaude, of L'Hôpital St. Antoine, Paris. Bensaude had been working on this method since 1921, and had therefore had very considerable experience before he published the details. At the time of writing the article he had tried his method on some 4000 cases. The number has now reached nearly 5000, and the method is still unassailable from the point of view of accidents or serious complications. With the exception of minor differences of technique and the difference in the solution used, the procedure is not unlike that advocated by Mr. A. S. Morley in this country. The use of quinine urea hydrochloride has, I think, one definite advantage over oily solutions of drugs that will produce sclerosis in that it has a local anæsthetic action and is not only absolutely painless but relieves any rectal pain that may have been present when the patient presented himself for treatment. An outstanding advantage of the treatment is its rapidity. Watching Dr. Bensaude work in the out-patient clinic is apt to cause astonishment at the speed and facility with which large numbers of cases are treated. In the private consulting-room, of necessity, the operation takes longer, but even when the procedure is a strictly one-man operation the whole thing can be carried out in ten minutes to a quarter of an hour.

Having watched Bensaude and being convinced of the tremendous value of this work, I started it some six months ago, and think that the experience gained may be worth attention, although it is limited.

Apparatus.

The solution used is a 5 per cent. solution of quinine urea hydrochloride. This is put up in 5 c.cm. ampoules, and keeps indefinitely; it does not need a large needle as it has not the viscosity of vehicles such as oil or glycerine. A proctoscope is necessary, but no particular model is indispensable—the simpler the better. Bensaude uses his own model, which has a long handle so that the hand which is controlling the instrument does not impede the vision. It also has a bevelled edge which, by the introduction of the obturator, can be turned round the full circle, bringing into view whichever arc of the rectum is desired. The best syringe is a 5 c.cm. model with an extension, made by Collin. It has two semi-circular extensions under which the index and middle finger of the hand can slide, and this enables the operator to control the point of the instrument with accuracy and to get a fair idea of the amount of pressure needed to drive the fluid through the needle. To the nozzle of this syringe is attached an extension about 4 inches long, and on the end of this, by an ordinary press-on joint, is fitted a 1 cm. platinum needle. It is

[1] Bensaude, R., and Cury, P.: Presse Méd., 1928, xxxvi., 706.

essential to use platinum because the ordinary steel needles affect the solution and cause precipitation and consequent blocking of the lumen. Platinum is excellent in every way, for it does not have this effect on the solution; it remains sharp for a long time; it is easily sterilised, and is very unlikely to snap. The long extension is necessary because in some cases of marked varicosity the vein may extend up the rectum as far as Houston's valve, and the injection may have to be made as far up as this. The only other necessities are two or three stick-swabs. These should be firm and strong so that, if necessary, exudate of the fluid through the puncture hole made by the needle can be controlled.

I am convinced that the most important requisite, apart from the essentials already mentioned, is a good light, for the whole object is to place the solution between the vein and the mucous membrane of the rectum and not in the vein itself. When working alone I find the best lamp is one made by Davidson, which by an arrangement of lenses throws a very good, even light, concentrated in a beam which fills the bore of the proctoscope, and so throws very few shadows. A high voltage lamp, situated over one's shoulder, has advantages, but, though admittedly it gives a strong light, there is too much play of reflection from the shining surface of the proctoscope lining, and consequently visibility is impaired.

Perhaps the most important part of the operation is absolute sterility. When dealing with a highly septic area, such as the anal canal, there is a temptation to be careless.

It might be justifiable to recall a case which occurred some little time ago, which is impressive, and which will act as a reminder that great care is necessary. In this particular patient a spreading ulcerative colitis supervened on pile injection with a carbolic solution in oil, which was followed by sloughing, septic absorption, and death. At the post-mortem examination it appeared evident that the lesion originated in the injected pile, and, though probably the resistance of the patient at the time of the injection was very low, that does not lessen the importance of the argument in favour of a careful technique.

As an antiseptic solution, the French tincture of iodine is the most suitable. It does not sting the patient and is stronger than the tincture of other countries.

Operative Procedure.

The instruments required—that is to say, the various portions of the syringe, the proctoscope, the obturator, and the swab-holder—are all taken direct from the steriliser just long enough to give them time to cool before they are actually needed. Gloves are always worn, and a finger-stall is placed over the index finger of the glove to make the preliminary examination before the injection is given. Where an extensive digital examination is necessary in a new patient seen for the first time it is as well to change the gloves after the examination. Plenty of lubricant is necessary for the painless introduction of the proctoscope, and K.Y. jelly is the best. This is slightly antiseptic and not greasy, a point which anyone who has ruined clothes or carpets with greasy lubricants will much appreciate. For examination the genu-pectoral position is undoubtedly the best, but for treatment the left lateral is to be recommended. The patient feels a slight prick as the needle enters the mucous membrane, and most people can bear pain better lying down than in an awkward position such as the knee-elbow. Furthermore, in the nervous type of patient, one has to remember that one is dealing with a highly sensitive area, and better relaxation is obtained if the patient is lying down.

When the anuscope is inserted with the light focused up the tube it will be possible to see in great detail any pile-bearing area in the rectum. One makes a mental note of the position where the piles are most obvious, and then carefully traces them up until no further sign of the varicosity can be observed. Just before this point is reached is the point where the first injection should be made. Successful treatment depends entirely on finding this position and on making the injection around the vein, and not in it or through it. It is rather difficult at first to control the end of the needle, as the needle with the extension is such a long one. Attempts to control the tremor of the hand by taking thought usually result in increased tremor; however, in a short time, the speed attained will do away with this.

When one has decided where to make the first injection a stick swab is pushed up, soaked in iodine, and the area carefully swabbed. The injection is then made, the amount given being sufficient to produce a definite wheal under the mucous membrane. Recognition of the point at which a sufficient quantity of fluid has been injected depends on the sense of definite resistance to the plunger of the syringe transmitted to the thumb. It is only by practice that some sort of constant can be obtained, but this is undoubtedly the best guide to correct dosage. The striæ produced, which have elsewhere been advocated as the signs of correct dosage, are of little value, because their appearance and intensity depend on other factors besides the submucous pressure—factors such as the condition of the mucous membrane and the amount of distension of the rectum.

Most patients do not complain of any pain and the prick of the needle often passes unnoticed. If the patient should complain of pain it is usually a sign that the needle has not been put in correctly and has been plunged too deeply or too shallowly. In the latter case the mucous membrane is being forcibly stretched and a considerable amount of pain is produced.

After the injection has been made and the pressure on the piston of the syringe has reached the point at which the needle is withdrawn, the proctoscope is drawn down the rectum and another injection is made, again swabbing the area, below the original injection. It is seldom necessary to give more than 3 c.cm. at any one sitting, and it is useless to try to hurry things by injecting too much. If one created three large bullæ by the injection of quantities of the quinine urea hydrochloride they would be of no use because they would probably act as an irritant to the bowel and produce a motion; the passage of the motion would squeeze their contents out again through the needle-puncture hole. On the withdrawal of the proctoscope a suppository is inserted to keep the walls of the rectum apart, and prevent any exudation from causing the opposing surfaces of the mucous membrane to stick together. This would produce pain on defæcation which the suppository will prevent, and, further, the suppository is an additional antiseptic guard. I use "Kuranol" suppositories (Roberts and Co.), which contain bismuth, witch-hazel, and carbolic, and have proved very satisfactory.

After the injection the patients should not do anything active for half an hour. They are sent back to the waiting-room and kept there quietly for the full 30 minutes. Many of them rather protest at this, as they feel perfectly well, but my experience is that if they go straight out they are liable to develop quite intense rectal pain an hour or so later. I can offer no explanation of this, but it is an observed fact, and the rest after the injection prevents it.

There are no sequelæ, except that in about 10 per cent. of the cases the injection is followed by an urgent desire to defæcate. This does not occur, as a rule, until at least ten minutes or so after the injection has been made, so that it need not be an embarrassment to the patient. Bensaude describes it as common, but in my experience it is not. Of complications, likewise, there are none of importance. When injecting the anterior pile-bearing area a certain amount of prostatic pain may be produced, but this does not occur unless the injection is badly made. The patients generally seem more sensitive here and feel the needle more than they do in other arcs of the circle.

Injections should be given only at weekly intervals and from six to eight is the average number required. It is as well to work diametrically across the imaginary clock circle which represents the rectum; that is to say, if the first injection is made at 6 o'clock the next should be made at 12, then at 9, then at 3, and so forth. If a bad injection is made and a pile is entered no harm will occur. The pile will either

remain unaffected or shrinkage will follow in the same fashion as in a varicose vein injected with quinine urethane or salicylate of soda.

It follows as a natural corollary from the general description of the technique that it is no use injecting external piles or piles when they are down. Prolapsed piles can, however, be replaced and the injection made immediately without any trouble. As in all injections of this nature, it is better to wait until the patient is free from any staphylococcal infection of the skin and to have any known septic areas treated before commencing the course.

This seems to be in every way a method of treating piles which deserves respectful consideration. It is painless; it is ambulatory; it is effective, and it can be performed by anyone who will trouble to master the technique. The pathological action—that is, the formation of a fibrosis around the neck of each pile—is a sound one in theory and in practice works well.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held in London on Dec. 21st, with Dr. J. HOWARD-JONES, the President, in the chair, a discussion took place on

MENTAL HYGIENE.

DR. RALPH CROWLEY said that the Society had not dealt with this subject as a definite part of its work and organisation; therefore some reference must be made to general principles as well as to details. It was a new movement, and those who had spent any considerable time in the United States would have been able to appreciate how great a movement it was. The whole idea of prevention as applied to mental disease, to subnormal mentality and defect, had really burst upon the medical profession. In America the prevention of insanity, delinquency, and mal-adjustments of all kinds could be said to be the talk of the town. This very familiarity, however, constituted a danger—greater in America than it was likely to become here—for people were attempting to deal with the question who were neither expert nor fully qualified. A consequence of this was that false hopes and expectations were raised. The prevention of mental defects and neuroses would probably be much more difficult than the prevention of physical troubles. It was clearly a task which the public health services must take on, though in America it was largely left to private enterprise. So great, however, had been the calls on public health administration in this country during the last 30 years that it seemed almost too much to ask that this new sphere of activity should be added to it. It was not very long ago that the main concern of the public health officer was with the grosser forms of detrimental environment; then, with bewildering rapidity, he had to get into touch with the individual through the infant welfare centres and the school medical services. If the public health officer should now attack the subject of mental hygiene it would make this individual touch even more intimate. Mental hygiene implied an attempt, in a concerted way, to deal with the causes and prevention of insanity, of crime, of delinquency, as well as of those less marked abnormalities which were probably at the base of many of the gross departures from the average. A good deal of valuable knowledge on this matter was now available, but it was not being pressed into service. And he did not think proper use would be made of this knowledge unless it was by the public health services. The work would also bring the medical officer of health into closer touch with other organisations and workers, those in contact with activities in the home, the school, and the court. To get real results in mental hygiene it was necessary to study social aim and method. It was hoped that the result of this new aim would be a uniting of two streams—i.e., the physical and the mental. The actual work would devolve on the expert physician and the expert psychiatrist, and in the future these expert services would be increasingly needed. The public health services provided an unrivalled opportunity for linking up all other activities, and also for planning over a long period of time, for following up, and for making systematic records. There must be channels along which the work of the expert could be made effective. He urged that there must be a concerted mental hygiene campaign by professional and lay workers. Many psychiatrists in America complained of the lack of channels along which their work could flow. The school medical services could make a great contribution in the study of the normal child, giving a definition of "mental health." A well-known authority in America had declared that 250,000 of the boys and girls in high schools would, in time, be in asylums, that a similar number would be in serious conflict with the law, and that a host would have their lives blighted by a variety of causes, many of which could reasonably have been prevented. In this country the proportion of delinquent children was certainly less than in the States, but the lesson was instructive. The key to the situation seemed to lie in the problems of behaviour in children, which so many people regarded as trivial. It was necessary to ask which features of the child's behaviour were transient, which were permanent, which were single traits, and which were accompanied by other manifestations. There was also the further question—what sort of organisation was needed to investigate and find a solution of these problems. He hoped special attention would be devoted to the budding delinquent.

The child-guidance clinics in America had four main functions. They were centres of service for the child, centres of educational propaganda, centres for training (doctors, psychologists, and welfare workers), and centres for research—since every faithful record was a piece of research work. He did not think the main development of this activity would come, in this country, through our hospitals; it must come through more normal channels, those of education, the school medical service, the local health service. Both psychiatrists and welfare workers should be available.

The Adult.

DR. EDWARD MAPOTHER confined his attention to mental hygiene as it concerned the adult. He laid stress on three of its aspects: the importance of mental disorder, the main defects in the present provisions, and some suggested remedies. To him, mental disorder meant a bodily disease whose main manifestation were abnormalities of behaviour and consciousness. But it must be recognised that the differences which underlay might be merely of the same kind as constituted differences of character and temperament in normal people. They were perhaps more extreme in development, but essentially the same in kind. Mental disease could be divided into organic and functional. There were four main factors in causation: (1) heredity; (2) some abnormality, perhaps incidental to a certain age or epoch of life—such as the menopause; (3) mental stress; (4) physical stress.

In speaking of mental hygiene it was necessary to include a consideration of early treatment as well as prophylaxis in the strict sense. In practice the opportunity for the prophylaxis of mental disorder scarcely arose; certainly it did not in the case of the adult. Some mental disorder arose as a by-product in the struggle against physical conditions which were injurious in themselves. For example, successfully combating venereal disease, or focal sepsis, had as a sequel a reduction in mental disease. In regard to functional mental disorder, prophylaxis in advance of the development of symptoms was, in amount, practically negligible. Positive eugenic measures be

did not regard as practical politics at present; our knowledge of heredity was not yet ripe, and our knowledge of any unitary mental characters which might be transmissible as such was practically nil. No satisfactory methods were available for combating abnormalities arising in adolescence, after childbirth, or in old age. And as for shielding the neurotic or the potential neuropath from stress in advance of his having displayed his attributes, Dr. Mapother was against attempting anything of the sort. Much of the best work of the world had been done by potential neuropaths putting up a great struggle against the risk of a breakdown. In this connexion there was much greater need for a doctrine of courage than for one of caution. But these remarks were not applicable to early treatment which checked the spread or development of mental disorder after its appearance.

The last figures of the Board of Control showed that at present there were in this country 42,000 congenital mental defectives, either in institutions or under some statutory supervision. That, however, was far short of the total number. The cost of these was in large part disguised under such headings as crime and pauperism. The certified insane, in whom mental disorder had developed during life, numbered 140,000. There were 21,000 fresh admissions yearly, and 9000 died, and 10,000 were discharged yearly, leaving an accumulating balance of 2000 a year. No figures were available about the incidence of neuroses, for the reason that nothing was done in connexion with them. But there were some striking neurosis figures furnished by the war statistics. Of the disabilities which resulted in the granting of a pension, 40 per cent. were due to wounds and 60 per cent. to medical disabilities, 12 per cent. of the latter being attributable to neuroses. In peace time, too, a large proportion of the people attending hospital out-patient departments were suffering from neuroses, which, if treated at the beginning, would have been cured.

It was an axiom as regards physical disease that any person in a civilised community was entitled to the remedial measures available for his relief, and if he could not himself pay for it, it was for the community to do so. No similar point of view, however, had been adopted in regard to mental disorder in this country or any other. Here the community —at any rate as a rule—did not concern itself with mental disorder until the patient had reached the stage in which he was incurable. It was only in so far as the person became a burden or a nuisance to others, or showed suicidal tendencies, that his care became the duty of the law or the community. This was a state of affairs which stood a good chance of being remedied in the next ten years. At present, for practical purposes, there was, for the poor, no provision of treatment in the uncertifiable stage of mental disorder. Secondly, there was a complete inability, even for the certifiable patient, to get treatment without submitting to the indignity of a detention order, which necessarily associated him with a number of chronic and protesting patients, though he himself might be quite a willing one. A third, and large, defect was in respect of even those who could pay for themselves, that they could not, if in a certifiable state, have voluntary treatment except in a mental hospital in contact with chronic and protesting patients. The proper way to deal with abuses which might arise through treatment of certifiable people in nursing homes was to insist on the registration and inspection of such homes and the notification of cases admitted to them, power being given to visit with heavy penalties the treatment of cases elsewhere. Whilst there was a good deal of agreement in principle about remedies for defects in present conditions, there was much divergence of opinion on details. The recent Royal Commission had insisted on the necessity of abolishing detailed formalities, and on opening up voluntary treatment of mental trouble in the poor. All were agreed that the two main requirements were research in causation and a very much improved training of medical men, so that they could recognise the beginnings of mental disorder and arrange for the appropriate treatment of their patients. But how far would the real difficulty of obtaining early treatment be solved by the mere reduction of formalities? What deterred the public was the certificate. The objection of early recoverable cases to going into mental hospitals—which he regarded as a reasonable objection—was unlikely to disappear in the lifetime of the average adult now living. It must be recognised that for a considerable period after the onset of mental disorder the treatment should be entirely apart; that the large mental hospitals should increasingly be places for treatment in the later stages of mental disease. The essential requirement was what had been found acceptable in the progressive countries of the world—i.e., the provision of clinics at which early stages of mental disorder were treated on an entirely voluntary basis, these also serving as centres for research and for teaching. This solution might be only practicable in large centres of population; still he felt very strongly that it was an ideal which should be held up as the form of provision really required.

The Child.

Dr. LETITIA FAIRFIELD said that the idea of mental hygiene was a very new one in public health, and it was one of the matters on which America was ahead of this country. In the States people were interested in covering the whole range of mental life with the same thoroughness as the physical was covered in this country. What had been well grasped across the Atlantic was the necessary contact between the school and the public health in relation to the mental hygiene in children. There, for the very young child, had been established "habit clinics," which she had seen at work in a number of cities. The psychiatrist and social worker cooperated in the training of character, and all kinds of help from outside was enlisted. Every factor, such as home life, school, personal associations, and conduct was investigated, and the psychologist determined the standard of intelligence, which was regarded as very important. In this country, when a really intractable failure in a child was met with, there was a tendency to let it slip. There seemed to be no provision for dealing with the very difficult child, and even such conditions as enuresis were allowed to go on, largely because the technique of dealing with them had not been properly worked out. It was, she insisted, very important to lay the foundation of mental hygiene by largely increasing the psychological and character-training side, which had already been started in connexion with child welfare. In large towns at least it might be well to devote one afternoon a week to consultations with a trained psychiatrist. The great bulk of this work would come through the school medical service. There should be less talk of what wonderful things the psychologist could do with cases taken to him from the children's courts or juvenile courts; the great effort should be directed to dealing with them before they got there. The origins of crime often lay in emotional and environmental defects in earlier life which had been allowed to pass untreated. If cases were dealt with at school age they would have been caught before defects had been hardened into habits and before the child felt he had a definite grudge against society because of some punishment received. It was surprising, said Dr. Fairfield, how much an emotional interference with work might keep a child back in school work. The temperamental type of child was very important from the standpoint of the early development of neuroses, and she gave several instances of the perpetuation of the condition into adult life, with consequent lessening of quality in work and continual conflicts with associates. Many people supposed that insanity would be stopped if only an interview with the doctor could be secured early enough; this disturbed people's views and increased their expectations to an unreasonable extent. Hope lay in making provision for nervous and mental disorders on the

same scale and on the same principles as provisions already existed for physical disabilities. It could not be too much emphasised that this was a matter for experts. Apparently simple cases, which seemed to need only common sense, really needed expert handling.

A brief discussion ensued.

Reports and Analytical Records.

BASY BREAD.

(BASY PRODUCTS CO., 4, LANCELOT-PLACE, BROMPTON-ROAD, S.W.3.)

THE claim is made that this bread is a true digestive food and reduces weight without causing flabbiness or wrinkles. When eaten in place of white bread it supplies the necessary roughage to promote functional activity. The crust of the cylindrical loaf is segmented to enable slices to be cut evenly without waste. The weight was 1 lb. 11 oz. and the price 1*s.* 6*d.* It is an agreeably flavoured brown bread.

On analysis the following results were obtained :—

Moisture	38·60 per cent.
Altered starch and dextrin	43·70 ,,
Protein	8·65 ,,
Mineral matter	1·96* ,,
Sugars	4·85 ,,
Crude fibre	1·50 ,,
Fat	0·74 ,,
	100·00
*Containing—Iron (Fe_2O_3)	0·004 ,,
Phosphates (P_2O_5)	0·2 ,,
Matter soluble in cold water	12·28 ,,
Calorie value per lb.	1095

On comparing these figures with those of other breads it will be noted that the fat is distinctly low and the protein rather high, and this tallies with the statement that the bread is nutritive rather than a fat former. The mineral constituents are also on the high side.

New Inventions.

MENISCOTOMY KNIFE.

ACCURATE division of the posterior end of the so-called bucket-handle lesion of a semilunar cartilage close to its attachment to the bone is difficult or impossible with a straight tenotome or other knife. The advisability of dividing the cartilage close to the tibia arises from the occasional finding of a tag at the back of the joint, with its sole attachment to the rest

FULL SIZES

of the cartilage close to the bone. To avoid such a tag being missed, the dividing knife must cut close to the bone in an oblique plane. The curved end of a Macdonald's dissector has been found a useful instrument for determining the precise direction in which the knife should cut. I have, therefore, had made for me a knife with a similar curve, a probe point and a short cutting edge, and this has been found to answer the purpose admirably. Since it is wiser not to use a double-edged knife inside the knee-joint, the knives are made in pairs, to cut to the right and left respectively. Experience has shown that these knives are sometimes useful in knee-joint surgery for purposes other than that for which they were designed.

Messrs. Allen and Hanburys are the makers.

H. A. T. FAIRBANK, M.S. Lond., F.R.C.S.Eng.

Reviews and Notices of Books.

A TEXT-BOOK OF MEDICINE.

By Various Authors. Edited by J. J. CONYBEARE, *M.C.*, M.D. Oxf., F.R.C.P., Assistant Physician to Guy's Hospital. Edinburgh: E. and S. Livingstone. With 16 illustrations and 8 plates. 1929. Pp. 976. 22*s.* 6*d.*

OF recent years there has been a tendency for text-books to be compiled by a series of authors. The personal note may be somewhat lost in the process, and perspective may be a little distorted, but additional completeness and accuracy can be expected, though we are happy to remember that at least one famous text-book was written almost in its entirety by a single author.

Dr. Conybeare's text-book is not entirely the work of his own hand, but he has written the greater part of it, besides acting as general editor. He has had assistance from Dr. W. H. Craib; from Dr. G. B. Dowling, who contributes the dermatological section; from Dr. E. H. R. Harries on the infectious diseases; and from Dr. Maitland-Jones on diseases of children; Mr. V. E. Lloyd writes on venereal diseases, Prof. H. MacLean on renal disorders, Dr. Geoffrey Marshall on respiratory diseases, Dr. Trevor Owen, of Toronto, on diseases of the liver and pancreas, and Dr. F. M. R. Walshe contributes the neurological section. This collaboration does not lessen the responsibilities of the general editor, since a very high standard may properly be demanded from expert contributors. No large text-book on its first appearance is ever free from slips, but there are scattered through the book a few mistakes that are not trivial. For example, the significance attached to the different tests for ketone bodies in the urine (p. 298) is not that generally accepted. The notes on the van den Bergh reaction, on pages 624 and 625, are neither clear nor correct; and in the section on oral sepsis (p. 550), though pyorrhœa alveolaris and apical infection are discussed, no mention is made of dental caries.

In the section dealing with the nervous system Dr. Walshe describes the common diseases admirably; the diagrams are well chosen and suffice to explain the text. Dr. Conybeare has himself dealt with the diseases of the stomach and most of the alimentary canal: the sections on gastric and duodenal ulceration are very good indeed. The rare type of cancer known as linthus plastica is omitted, though the Plummer-Vinson syndrome receives notice. The unqualified support of surgery in all cases of acute pancreatitis (p. 654) is somewhat surprising. Prof. MacLean devotes most of the space alloted to him to a description of nephritis in its œdematous and uræmic forms. This has been the practice in continental text-books for many years; Prof. MacLean is careful to explain its shortcomings, but considers that such a classification is of greater practical value to students than one based solely on morbid anatomy. It is open to doubt whether a clinical classification of such simplicity on the surface is likely to prove of advantage to students at a time when it is being gradually abandoned by its supporters and originators on the other side of the Channel. The section on the infectious diseases might be improved by the use of small diagrams to illustrate the age and seasonal incidences of the various fevers. All the accounts in this section are thoroughly up to date and are written in a brisk style. In the section on diseases of the cardiovascular system a plea is made for greater recourse to the electrocardiograph, and the diagrams in this section are drawn from it. The importance of knowing what the heart is doing, rather than what it is saying and murmuring, is constantly kept before the reader. The article on the anginal syndrome is perhaps a little too brief, but all the other parts are well balanced and the essential points made clear. The section on the diseases of the respiratory tract opens with some welcome simplified dogma on the subject of the physical signs

in the chest, continues with descriptions of the chief respiratory diseases, and includes a subsection describing allergic conditions of the respiratory tract. The articles on pneumonia and bronchiectasis have been cleverly condensed. Tuberculosis has been relegated entirely to that part of the book devoted to the infectious diseases; the whole subject occupies only 40 pages of closely packed matter, and can be read in a couple of hours without giving rise to exhaustion, though it could not be properly digested at one reading. We miss a section of psychological medicine and insanity, though diseases of children and dermatology find a place, and the few pages beginning on p. 877 would have been better expanded and amplified into a section separate from neurology.

In his preface Dr. Conybeare points out that he has made no attempt to render the book in any way a substitute for manuals of clinical methods. His aim to produce a complete text-book in as small a compass as possible and at as low a cost has been well attained. If in a future edition space is required for new work, the long description of the history of vaccination on page 45, and the detailed technique described in the following pages could be omitted, for this matter is not strictly essential in a volume in which economy of space has been the plan. It is questionable, too, whether the editor's excellent notes on examination for life assurance are relevant in a volume which deliberately avoids many of the minutiæ found in larger text-books. But the book as it stands is one which can be confidently recommended to students and practitioners. It is clearly printed and it "opens" well. The phraseology throughout is refreshingly clear; new aphorisms and abundant pithy verbal illustrations are supplied, and the index is good.

A TEXT-BOOK OF SURGICAL DIAGNOSIS.

By Various Authors. Edited by A. J. WALTON, B.Sc., M.S., F.R.C.S. Two vols. London: Edward Arnold and Co. 1928. Pp. 1121. 63*s*.

THIS is an important book, being, we believe, the largest work on surgical diagnosis which has yet appeared from the English press. It is a composite effort, the editor having obtained the aid of upwards of 30 contributors, each of whom is an expert in the department of surgery of which he writes. There is one American name amongst them, whose inclusion prevents us from appraising this book as a purely British production. Allen B. Kanavel is known all over the world for his classical researches upon infections of the hand and his teaching has been everywhere accepted; no greater authority could have been chosen.

Volume I. deals with the diagnosis of inflammation, the specific infections, gangrene, shock, hæmorrhage, diseases of the limbs, cardio-vascular and lymphatic systems, head and neck. Contributors are Sir Lenthal Cheatle, Dr. P. N. Panton, Mr. Philip Turner, Mr. Seymour Barling, Mr. E. Rock Carling, Dr. P. Manson-Bahr, Dr. E. C. Hughes, Dr. J. H. Sequeira, Mr. David Lees, Mr. Russell Howard, Mr. H. S. Souttar, Mr. E. R. Flint, Mr. Harry Platt, Mr. H. A. T. Fairbank, Mr. James Driberg, Mr. R. Milne, Mr. Blundell Bankart, Mr. Timbrell Fisher, Mr. Geoffrey Jefferson, Dr. George Riddoch, Dr. W. E. Tanner, Mr. Norman Patterson, and the editor. Volume II. is concerned with the abdomen and thorax, and the contributors, in addition to some already mentioned, include Mr. Tudor Edwards, Mr. Zachary Cope, Mr. W. S. Perrin, Prof. D. P. D. Wilkie, Mr. Gordon Taylor, Mr. Lockhart-Mummery, Prof. S. G. Macdonald, and Mr. Victor Bonney.

The different sections are built up very much as in a systematic text-book of surgery. For instance, in the chapter on Injuries and Diseases of the Pancreas, injuries, calculi, acute pancreatitis, chronic pancreatitis, cysts and tumours of the organ are described with their characteristic histories and symptoms, and the similarity of the clinical pictures to that shown in other diseases is mentioned, as also any special laboratory methods of diagnosis and their value. Ætiology and pathology are discussed where they have a bearing on diagnosis. It is difficult for a writer to know how far to proceed in these directions without transgressing the legitimate scope of a treatise on diagnosis. The authors have without exception shown great judgment and discrimination in the inclusion or rejection of subject matter; throughout the book practically nothing irrelevant or redundant is printed. Mr. Walton in his preface refers to the tendency for operative treatment to outstep surgical diagnosis, and hopes that the volume will be of "real service to the busy practitioner and surgeon." It certainly will—but it falls short in two respects. The first is not a defect in the actual information given, most of which is excellent, but in the plan upon which the book is constructed. How will the busy practitioner who has a patient with a deformed hand, or an enlarged and bent tibia, or a tumour of the neck or orbit, for example, derive assistance from consulting its pages? He will find that he must first give the condition a name and then only will he be able to turn it up and see whether or not he is right in his surmise. The contracted hand of Dupuytren is in one section, two pages further on is a description of the hand in Volkmann's contracture, ten pages later appears an account of the claw-hand of cerebral diplegia; in a completely different section the claw-hand of ulnar paralysis is described, and in still another distant section are the deformed hands due to arthritis deformans or gonorrhœal polyarthritis to be found, these last two not even together but separated by 20 pages. Again, if the doctor suspects a bent tibia to be due to osteitis deformans he can turn up this section and confirm his suspicion, but he will have a difficult search to find any account of a bent tertiary syphilitic tibia, with which Paget's disease may be confused. These two simple examples show how an otherwise admirably written and informative book may fail to supply the needs of the diagnosing practitioner. How much better and more helpful is the regional method of writing a book on diagnosis is seen in sections such as those on the lips, jaws, mouth, and salivary glands, for example, where this system has been adopted.

The second point to which criticism may be directed is the lack of detail in the description of diagnostic measures. In such a large treatise, as large as many complete text-books of surgery for the student, reasonably full accounts may be expected. For instance, suppose the surgeon consults this book on the value of the indigo-carmine test in estimating kidney function. On p. 952 he will find that "with disease of the kidney the appearance of the colour may be delayed (or may not appear at all)," but he will remain in doubt as to how much delay after the "six or seven minutes" when it first appears is really significant of serious functional disease. Again, it would be difficult for anybody to use a sigmoidoscope from the account of "examination with the sigmoidoscope" (p. 630), and no adequate instructions as to how to carry out the manipulations necessary to diagnose a stricture of the urethra are supplied. On the other hand, the technique of thoracoscopy and œsophagoscopy are well described.

Apart from these two points the general standard of the work is uniformly high, no mean achievement where so many authors are concerned, and one which reflects great credit upon the editor. The book is well written, well printed, well illustrated, and accurate. It will no doubt appeal to a wide circle.

LOOKING ROUND, A MISCELLANY.

By Lord RIDDELL. London: George Newnes, Ltd. 1928. Pp. 190. 2*s*.

Lord Riddell, lawyer and journalist, employs a versatile and sympathetic pen to write 17 short essays on persons who have played prominent parts in the drama of public life. Some of these are alive to make their influence felt to-day; some are dead though not asleep; in one way or another each represents an influence. Three of the essays will

make particular appeal to medical men—namely, the biographies of Clemenceau, Huxley, and Sydenham. Of Clemenceau we learn that he comes of a race of doctors long resident in La Vendée, landowners as well, who "being of independent means did not charge for their services," a piece of philanthropy at the expense of the medical profession that was not exercised by Clemenceau himself while he was a Paris practitioner. Of Huxley Lord Riddell says, "Whatever power of accurate thinking or writing I possess I owe largely to him, a debt which hundreds of prominent workers without scientific training must have felt." In "A Medical Saint" we have a brief appreciation of Thomas Sydenham, "one of the five great medical saints" whom the author describes as "a sort of medical Bacon"; the other four saints whom he places in the medical hagiography being, of course, Harvey, Jenner, John Hunter, and Lister. Other personalities dealt with are those of Lord Balfour, Parnell, Sir William Joynson-Hicks, Lord Leverhulme, Lord Bryce, Sir John Simon, President Wilson, Lord Curzon, Augustine Birrell, Mussolini, and a little known mathematical genius, one Scrinivasa Ramanujan, F.R.S. In "A Mysterious Affair" the story is told of Sir Thomas Overbury's murder, which for 300 years has perplexed historians and lawyers. Lord Riddell's summing up of the contradictory evidence, in light of the no less contradictory theories of motive, leads him to suggest that King James was privy to the crime.

HYDATID DISEASE.

Its Pathology, Diagnosis, and Treatment. By HAROLD R. DEW, M.B., B.S., F.R.C.S. Eng., F.A.C.S., Hon. Surgeon to Out-patients, Melbourne Hospital; Jacksonian Prizeman, Royal College of Surgeons of England. Sydney: The Australasian Medical Publishing Company, Ltd. 1928. Pp. 429. 27*s.* 6*d.*

THE prevalence of hydatid disease in Australia has afforded special facilities to workers in that country for the study of its ætiology and treatment. Nevertheless, until comparatively recently, the diagnosis of this serious condition during life has been so difficult and the method of development of the hydatid cyst or the intermediate host so doubtful that an authoritative statement by such a well-known worker as Mr. Dew is welcome. We owe the recent advances in the study of hydatid disease principally to Dr. F. Dévé, of Rouen, and to Mr. Dew himself; others have contributed towards more accurate diagnosis by devising serological tests, amongst whom the name of Hamilton Fairley takes first place.

In this volume Mr. Dew deals with hydatid disease in the most minute and exhaustive manner, giving adequate references to each aspect of the subject. After passing in review the history of *Tænia echinococcus*, he writes on ætiology and prophylaxis with special reference to Australian conditions. There is no doubt that slaughter-yards and abattoirs in that country constitute important sources of infection. An enormous number of sheep are slaughtered annually in Australia for human consumption, and, since the incidence of hydatid disease in these animals is very high, a great number of viscera are rejected as unfit for human food, and some are eaten by dogs who have access to unguarded offal pits. Of all the British Dominions overseas New Zealand and Australia possess by far the greater number of sheep per head of population, the figures standing at 15·3 and 13·3 respectively. Mr. Dew's carefully compiled statistics of the distribution of hydatid disease in Australia will be read with interest; but of greater scientific importance is his account of the development of the cyst in the intermediate host and his interpretation of the various changes which take place within the cyst wall, a subject on which his views, founded on original work, have gained almost universal recognition. In Chapter VIII. are described the special diagnostic methods—by acupuncture, by serological tests, and by the intradermal reaction of Casoni—which help us to recognise the condition during life. A special chapter is devoted to hydatid anaphylaxis and ten others to a consideration of the clinical and pathological manifestations of hydatid cysts in various parts of the body. There are 87 illustrations, mostly original, and all excellent.

Manifestly this is a most thorough and excellent piece of work. Mr. Dew has produced a book which will bring credit to the great hospital to which he is attached.

Hydatid Cysts of the Lung of Children. By M. H. VEGAS, M.D., F.A.C.S., F.R.S.M., Hon. Professor and Member of the Academia de Medicina de Buenos Aires. Buenos Aires: S. A. Imprenta Lamb y Cia, Ltd. 1928. Pp. 300.

THIS brochure, which is dedicated to the American College of Surgeons, deals with a study of hydatid cysts occurring in children. In Argentina, where echinococcus is unfortunately very common, the author has been continuously engaged on this study since 1893. Out of a total of 25,000 children's histories recorded in his archives there are 50 of hydatid of the lung, practically all of which were operated upon by the author himself. Unfortunately, Dr. Vegas has had great difficulty in obtaining access to Australian publications in Argentina with the result that the original work of H. R. Dew and N. Hamilton Fairley has not reached him, and consequently his description of the development of the hydatid cyst differs considerably from the modern view. This matters less in that the chief interest of his book centres upon treatment; the operation of thoracoplasty, as performed by the author, is discussed in detail. A great portion of the work is occupied by details of illustrative cases, which take up over 100 pages, and by a bibliography referring to Argentine publications on hydatid disease.

ASPECTS OF AGE, LIFE, AND DISEASE.

By Sir HUMPHRY ROLLESTON, Bart., K.C.B., M.D., Hon. D.Sc., D.C.L., LL.D. A volume in the Anglo-French Library of Medical and Biological Science. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1928. Pp. 304. 10*s.* 6*d.*

THIS book, by the Regius Professor of Physic in the University of Cambridge, forms one of a series now being published, in both languages, in the Anglo-French Library of Medical and Biological Science, under the general editorship of Dr. F. G. Crookshank (London) and Prof. René Cruchet (Bordeaux). Sir Humphry Rolleston here reprints 13 papers which have appeared at various times within the past few years in different journals, and has taken the opportunity of making a few additions and amendments. Most of these papers will be familiar to our readers, but it is convenient to have them collected together into one handy, well-printed volume. We are not sure whether it was, or was not, Sir Humphry Rolleston who originated the dictum that when a medical man begins to write on the history of his subject it is a sure sign of senility. The historical papers in this book show how interesting the study of medical history can be made to the average medical man by a master hand; if indeed this skill be a sign of senility we hope that Sir Humphry will long continue to enrich the literature of our profession with like signs. Apart from the historical side, exemplified in the papers on old age, clinical variations in disease from the historical standpoint, and the paper on Samuel Johnson, Sir Humphry is at his best in such subjects as the medical aspects of holidays, poetry and physic, professional careers, and the changes in the clinical aspects of disease. Those of his old pupils who have attended his museum classes and have been his clerks and house-physicians will be glad to have in their possession a volume wherein the philosophy and catholicism of their master is so well exemplified. The book will also appeal to a wide circle outside the profession. The literary output of Sir Humphry has been great; but this little volume of collected addresses will enhance his reputation as a scholarly physician.

THE LANCET.

LONDON: SATURDAY, JANUARY 5, 1929.

THE KING'S ILLNESS.

THE New Year brings but little lessening of the concern with which the KING's illness is watched both in this country and elsewhere. The path to convalescence has proved steep and difficult; almost too steep, indeed, for a man exhausted by so many weeks' infection. Its dangers have been only too apparent, and that many of them have still to be surmounted is clear from the cautious bulletins of HIS MAJESTY'S advisers. The news they contain is amplified in the following statement which has been drawn up for the information of the medical profession:—

"For true understanding of the position it must be emphasised that neither in its inception nor in its subsequent course has this illness conformed to what is called 'pleuro-pneumonia'; rather was it a streptococcal septicæmia which by fortunate happening localised at the base of the right lung, first imperfectly and later as an empyema ('fixation abscess') forming between the base of the lung and the diaphragm. In the second phase of the illness [vide report in THE LANCET of Dec. 22nd, 1928] the clinical picture—dusky appearance, dry cracked tongue, delirium, subsultus, exhaustion—was that of a severe toxæmia and resembling that of a case of severe typhoid fever in the third or fourth week. So now, the picture is that of the aftermath of a severe general infection. The empyema wound is now clean and steadily diminishing in size, the discharge from the pleural cavity is small in amount, and the streptococcus grown from the pus (identical with that originally found in the blood) is diminishing in potency. Eusol has been an effective local application, and though through the courtesy of an American colleague, Dr. Sherman, of Pittsburgh, a supply of Dakin's solution, electrolytically prepared, has been recently received, there has been no opportunity to use it because the necessity of any such local application has passed. On the other hand, the disinclination for food and the dryness of the tongue, the low blood pressure, the weakness and wasting, the notable exhaustion, though slowly improving, will for long be an anxious problem. It will be readily understood that while this exhaustion state is pronounced, the margin of reserve power must be narrow and that small setbacks, inevitable at this stage, have a correspondingly more severe effect. It is important that the public should not interpret such setbacks or reports of 'no change' as relapses. During each week there will be ups and downs, and progress will consist of a slow and increasing predominance of the ups over the downs. One of the inevitable difficulties in so long an illness is to convey to the public a true picture—neither too bright nor too dark. It is for this reason, amongst others, that the courtesy of the medical press is valuable in order to convey, through their readers to the public, fuller information and so avoid the risk of misunderstanding. As regards nourishment, about which so many suggestions have been received, the difficulties will be understood when it is stated that there is disinclination for most foods and dislike for many, and that weakness necessitates that nourishment be given by a nurse with a feeder. Adequacy of nutriment both as regards quantity and variety is now being secured, though not without difficulty. Moreover, the combating of loss of weight, which has been notable, depends not only on food taken, but food digested and assimilated, and here again the exhaustion tells its tale. The blood pressure has fallen too low, and the calcium content of the blood has of late considerably decreased. The administration of calcium, parathyroid extract, and strychnine is apparently beneficial. The same is true of ray-therapy, which is being continued. It need hardly be stated that the question of transfusion has received full consideration. In an illness of this complicated character the indications for transfusion must be clear, and it must be remembered that with the most skilled procedure its employment would in this case entail risk. The striking results following transfusion—e.g., in cases of anæmia due to either hæmorrhage or infection—are apt to lead to its employment in other conditions without adequate consideration of the pros and cons. It is sufficient to repeat that in this grave illness it has been fully considered and put aside at the present stage as definitely undesirable. Moreover, the red blood count is one of the most hopeful features, for whereas in the early days of the illness the red count was as low as 2,900,000, to-day the count reaches 4,300,000. Moreover, the exhaustion is as much a weariness of mind as of body. Though there is an increasing sense of the burden of his illness, the will of the KING to live is there. Because of the exhaustion the course must be long and for the present anxious. None the less improvement and progress are taking place slowly, but surely enough to justify the hope that the KING will be restored to his people."

The note of encouragement with which this statement ends will do much to renew a hope which has at times fallen very low. On the other hand, the obstacles to recovery are frankly set out, and no medical reader will gain the impression that their removal is purely a matter of time. Though there is increasing reason to think that the preservation of the KING'S life during these many weeks will not have been in vain, a more definite and settled improvement is unfortunately needed before our anxiety can be replaced by confidence.

HIGH-FREQUENCY CURRENTS IN INTRACRANIAL SURGERY.

WHAT is probably the first attempt on a large scale to use high-frequency electrical currents in intracranial surgery has recently been made by HARVEY CUSHING,[1] and the preliminary results are very promising. In this work CUSHING has had the assistance of that brilliant physicist, W. T. BOVIE, who has provided an apparatus that furnishes a current of 1 million to 3 million alternations a second. By modifying the current in various ways it is possible to produce various different effects upon living tissues, the most important being superficial dehydration, cutting, and coagulation. The apparatus can thus be used to incise the brain and to remove whole tumours or portions of tumours without bleeding, to seal bleeding points, and to bring about massive coagulation of large blood-vessels. The effects depend, as BOVIE points out, "upon the heat developed by the current in passing from the active electrode *into* the tissues, or upon the ohmic heat developed by the current in passing *through* the tissues."

Surgical diathermy or endothermy, as it is called,[2] has hitherto been used almost entirely for the removal of malignant tumours, and one of the chief advantages claimed for it has been the destruction of outlying malignant cells that might escape and seed

[1] Surg., Gynec., and Obstet., 1928, xlvii., 751.
[2] See THE LANCET, 1927, i., 1031.

themselves into the remaining tissues if the operation was performed by scalpel. CUSHING seems to have begun using BOVIE'S machine with this idea, but after a few experiences with malignant tumours he realised that the chief merit of the method for his purpose was that it could cut bloodlessly and without pressure. Accordingly he proceeded to attack large encapsulated vascular meningiomas on the base of the brain—tumours which from their extreme vascularity and inaccessible position had hitherto defied all, or almost all, attempts at successful removal. A large meningioma arising from the olfactory groove and growing upwards into both frontal lobes was encountered at operation; only a small part of its surface could be exposed; but by means of an active ring-shaped electrode it was possible to remove bloodlessly loopfuls of the interior of the tumour—"scalloping," CUSHING calls it—until the shell began to collapse so that it could be taken away entire without any more traction or pressure on the surrounding brain than had been required for the original exposure. This process of piecemeal removal of meningiomas proved tedious and led to operations lasting as long as nine hours; but the results of a series of cases show that a very definite advance has been made. Since the introduction of the BOVIE apparatus two years ago CUSHING has completely removed ten large meningiomas of the olfactory groove with only two deaths, and these among early cases of the series. No longer, he shows, is it necessary to attempt enucleation of these tumours, or of similar growths in other parts of the brain, at the expense of laceration and severe retraction of the surrounding tissue. His next move was to try the effect of electro-surgery on the angiomas—tumours consisting of a congeries of large blood-vessels, whose removal by older surgical methods has usually led to fatal hæmorrhage—and he found that by treating the surface of the tumour with a highly damped desiccating current enough thrombosis was induced to make removal possible at a second operation one or two weeks after the first. In several cases total enucleation of gliomas of the fourth ventricle and vermis was delicately and successfully carried out. Further advances were also made in the treatment of acoustic neuromas.

This work of CUSHING and BOVIE marks a notable advance in intracranial surgery, and it will also arouse a desire for more knowledge of the interactions of electrical currents and living tissues. Thus it may have results that will be of great value not only in the treatment but also in the diagnosis of disease.

THE VIRTUES OF MILK.

ON another page appears the second report of the Scottish Board of Health's inquiry into the dietetic value of milk. It confirms and extends the results published last January,[1] for at all seven centres of investigation the groups of children receiving milk showed a gain in height and weight much greater than that of their contemporaries who got a biscuit ration of the same caloric value. The improvement in the general health was such that the groups of children receiving milk could be picked out merely by inspection. The good effects of adding milk to the diet were, indeed, even more obvious in the period covered by this second report than they were in the previous period, and it was significant that the improvement was mental as well as physical. Dr. C. A. DOUGLAS says that "general alertness was common to all the children fed on milk. . . . It was gathered from teachers and janitors that the children receiving milk were much more alert and very much more boisterous and difficult to control than the others." Another notable result was that with one exception no great difference was observed between the groups getting whole milk and those getting separated (skimmed) milk. This is convincing evidence of the high nutritive value of skimmed milk, but it would be a mistake to conclude from these observations that the part is as good as the whole, and no such conclusion is drawn by the investigators. The conditions of experiment did not permit of an absolute comparison between whole milk and separated milk, for the ration of milk and biscuits was given in supplement to what the children were already having at their own homes. The home diet was an unknown factor in the experiment, and the extent of its deficiencies must necessarily determine the extent of the improvement seen in the milk groups. If, for instance, the home diet included leafy vegetables or butter or a margarine containing vitamin A, the addition of separated milk would probably be nearly as efficacious as the addition of whole milk. Moreover, though height and weight are obvious and measurable criteria of good health they are not the only ones. Another important manifestation of health is the power to resist disease, and here we have good reason to think that even comparatively slight dietetic deficiencies, if sufficiently prolonged, will predispose to infections which find an entry through the mucous membranes of the respiratory and intestinal tracts. The importance of the dietetic factor in determining the resistance to infection may indeed be greater than is at present suspected, and it would considerably add to the value of the Scottish investigation if subsequent reports gave detailed information on the clinical history of the different groups of children.

In commenting on the first report of this investigation we pointed out that the results obtained by addition of milk to the dietary are neither new nor astonishing; nor is such a claim made by those who are conducting it. Two years ago Dr. CORRY MANN published an account of an inquiry on the same lines which gave the same results. In the following year we published a paper[2] in which Dr. W. CRAMER emphasised the exceptionally high dietetic value of milk. He calculated the daily requirement per head as being about two pints—which may, of course, be consumed either as such, or in the form of butter and cheese—and he showed that in this country the actual consumption is far below this figure so far as a great part of the population is concerned. The same view was forcibly expressed by Sir GEORGE NEWMAN in his annual report for 1927. An American authority on dietetics, Prof. E. V. MCCOLLUM, speaks of milk as a "protective food" and arrives at the same figure as Dr. CRAMER for the minimal daily requirement. The fact that in the Scottish investigation the addition of one pint of milk to the diet produced so striking an improvement confirms incidentally the contention that large classes of the population suffer as a result of taking too little.

This reminder of the unique dietetic value of milk comes at an opportune moment. The distress in the mining areas of South Wales and Durham necessarily involves the risk of undernutrition in large numbers of the population, and it is of paramount importance that the funds collected for relief, in so far as they are expended on food, should be spent wisely and economically. The problem is to construct a palatable dietary which satisfies the dietetic requirements at the minimum of cost. Obviously the solution of this problem cannot be difficult, for it is a fundamental

[1] THE LANCET, 1928, i., 202.

[2] Ibid., 1927, ii., 774.

economic problem which the bulk of civilised mankind has always had to face, and it must have been successfully solved by generation after generation. Now it is the dietetic experience of civilised man that a dietary is sound both from the economic and from the physiological point of view if it is built around a basis of cereals and milk. There is nothing in our recent knowledge of dietetics which runs counter to this practical experience. On the contrary, research has justified it. It has also enabled us to understand that in this simple form of dietary the whole cereal cannot be replaced by some refined product obtained from the cereal. In this country cereals are consumed mainly as wheaten bread. The more the caloric requirements of a dietary are covered by bread the more important is it that all the bread eaten should not be white bread, and that at least some of it should contain an adequate admixture of germ or its equivalent. Milk can be consumed either as such or in the form of butter and cheese. Unfortunately, the use of whole milk and of butter is expensive, but the results of the Scottish investigation justify the replacement of whole milk by separated milk provided that a brand of margarine containing vitamin A is used to replace the butter. A dietary, therefore, of porridge, brown bread, separated milk, margarine containing vitamin A, and cheese, would cover almost all nutritive requirements at the minimum of cost. It only requires to be supplemented by the addition of a small amount of fresh vegetable food to make it an adequate diet. If in the distressed areas a basal ration of porridge, bread, one pint of separated milk per head, and an ounce of margarine containing vitamin A were distributed, it would protect the people against most forms of undernutrition; and although in itself such a diet would not be adequate in every respect it is probably better than those on which, from ignorance, a large part of the people of this country now live. On the basis of such a dietary it would be possible to calculate almost to a penny the cost of supplying the distressed areas with food, so that the public and the Government could then appreciate the extent of the task with which they are faced. If the available funds are inadequate to meet the cost it should at any rate be applied to the children and to the nursing and expectant mothers whose health would suffer most from undernutrition. A scheme of this kind recommends itself not only as a measure of properly regulated charity, but also as one of wise economy. For the effects of extensive undernutrition are certain to lay a lasting and heavy burden on the community in the shape of permanent disablement and disease.

THE FUTURE OF GENERAL PRACTICE.

AT almost every hospital dinner someone says amid applause that the general practitioner is the backbone of our profession. Is this only an ancient form of words or does it express a faith alive enough to breed action? The question needs an answer now if ever, for a vague irresolute opinion will do nothing to govern events. General practice is losing its place of first importance in medicine and unless it is regenerated and supported there will be fundamental changes in the structure of the profession as a whole.

The medical needs of the public are always enlarging and varying. At the time when this journal was founded they were mostly fulfilled by a single person, the family doctor; whereas to-day we see a vast machinery of hospitals and public health organisations set up to supplement his efforts in healing and preventing disease. Their work is sometimes said to "encroach" upon his practice, and so indeed it does. But it has all arisen because, for one reason or another, the community could not get from him the care and teaching it wanted. If tuberculosis, infant welfare, venereal diseases, and much of general medicine and surgery have been diverted to clinics and hospitals it is because—from the social point of view—the private practitioner has not been able to cope with them effectively. Sometimes people cannot pay his charges; sometimes they must have institutional care of a kind he cannot given them; sometimes they want more time than he can spare in the daily round; and sometimes they need a skill he does not possess. It has become impossible to unite in one man anything like a complete knowledge of modern diagnosis (let alone treatment), and the public must have, beyond the family doctor, the services of men who have made a study of pathology, radiology, neurology, and psychology—the eye, ear, nose, throat, teeth, and many another specialty Where the poor are concerned society has made arrangements for the care of infectious fevers, insanity, mental deficiency, physical deformity, and a host of other conditions; some of the big industrial firms are taking it upon themselves to look after the health of their employees; and even in the middle and upper classes the scope of general practice is steadily contracting. Many patients like to be treated at hospital rather than at home for their acuter illnesses; parents subscribe to clinics where they can get specialist advice about bringing up their babies; and there is a widespread feeling in favour of the expert as opposed to the merely benevolent. Some say, therefore, that it is the fate of the family doctor to become a sort of shopwalker who will send his patient promptly to the right department and disclaim personal responsibility for knowledge. While agreeing that this may well happen unless steps are taken to stop it, we believe that such a degradation of his functions would be against the public interest. The specialist, like the laboratory, is a good servant but a bad master, and what the average man chiefly needs is a doctor who will shoulder full responsibility for his treatment and take over the burden of his difficulties when he can no longer meet them. He wants someone who will look after *him* rather than his disease, and for this purpose he is best in the hands of a man he knows and who knows him and his surroundings. The hospital may offer skilful nursing and apparatus of investigation; the specialist is indispensable; but neither is the best kind of guide during the indefinite periods of ill-health which are the constant lot of many working men and women. The family doctor can do more than either to influence the daily life of those in his charge, to see that the children are properly nourished and are growing up with no removable handicap to ensure that pregnancy and childbirth shall follow a normal course—in short, to introduce the spirit and practice of preventive medicine into the home.

If it is accepted that general practitioners ought to keep the chief responsibility for the diagnosis, treatment, and prevention of disease—that they should remain the backbone of our profession—we may well ask what equipment and opportunity they are given for holding their own in face of the growing demands of the public. This is not perhaps the time to discuss the whole subject of education, fees, hours of work, holidays, and post-graduate teaching, but it is emphatically the time to consider whether general practice is to lose or gain its life from the legislative changes now approaching. Having suggested that the ideal practitioner should have a good knowledge of diagnosis and treatment, together with an informed

enthusiasm for public health, we are forced to admit that the present system does much to prevent his having either. The young doctor may leave his teaching hospital with a determination to keep up with advances in technique; is it to be certain of his doing so that we make it hard for him to get appointments at his local hospital? He may wish to learn all he can (say) of infant hygiene, antenatal work, tuberculosis, venereal disease and other specialties; is it to ensure that he shall be competent as a practitioner, and shall be imbued with an interest in preventive medicine, that we reserve most of the posts in the public health services for whole-time workers? All this is done in the name of efficiency; and doubtless it is true that a public health department is most easily run by public health officials alone. At the same time experience shows that private practitioners can be successfully enlisted to do this work, and the ultimate advantage of such a plan is beyond all question. Much talk is heard about good feeling between medical officers of health and doctors in their neighbourhood, but the only kind of coöperation that will weld the medical profession, as at present constituted, into a single and efficient instrument, is the coöperation by which young men in private practice are given a large part in working the public services. It ought to be the rule that all those who join a firm as assistants or junior partners should take appointments at the municipal clinics and treatment centres of the locality. At first they would act as clinical assistants and later would hold more responsible posts, their time being adequately paid for on the understanding, of course, that they will look on their public work as taking precedence, during hours of duty, over private interests. Results would eventually justify this policy over and over again, but its adoption needs long foresight. Unluckily, even where well established, it is likely to be put to a severe test during the next few years, for more and more of those who sit on county and borough councils will be in favour of having an easily directed staff of whole-time officers. We shall see an attempt, in the name of symmetry and efficiency, to develop municipal medical services divorced from private practice except in so far as they control and limit it. As a corollary we shall probably see the poor-law hospitals, when they are made over to municipalities, staffed as far as possible by whole-time physicians and surgeons; and if this is done the golden chance of regenerating general practice will be lost. Nothing could be simpler than to set up a hospital service under the public health authorities—a service self-sufficient and self-contained. But to do so would be to condemn the private practitioner to an increasing obsolescence. Without access to hospital for his patients, without facilities for diagnosis or contact with his colleagues, no medical man can properly do the difficult work that is required of him. On the other hand, cottage hospitals up and down the country have shown what can be done by bringing doctors into touch with one another and by offering them better chances of investigating and treating their cases, and we are convinced that to give private practitioners the main part in looking after patients in the municipal (lately poor-law) hospitals would do more than anything else to raise the level of medical practice in this country. To close the doors against them—however convenient and economical this may prove—will be a grave blunder unless it is truly desired that the public service shall ultimately take over all their important duties. The general practitioner can either be brought into the scheme of things or crowded out of it. He can either be doomed or redeemed.

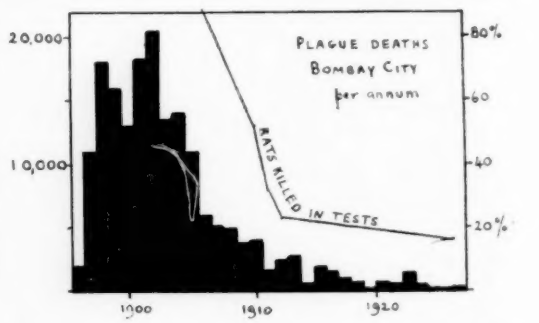
Annotations.

"Ne quid nimis."

MASS IMMUNITY.

MAN'S resistance to infection may be of three kinds: (1) natural immunity (e.g., distemper), inherent in the constitution of the species or subspecies; (2) mass immunity (e.g., measles) acquired by a population having been exposed to the infection in the past and a resistant race having been selected out; (3) individual immunity (e.g., small-pox) from an obvious or suppressed attack or from artificial inoculation. The last two forms almost necessarily overlap in human experience and individual resistance is superadded to a greater or less degree of mass immunity. The resistance of men to any infection no doubt varies just as their every other measurable quality varies. Most individuals have something near the average immunity, some are very susceptible, some very resistant. These qualities are heritable and the progeny of the survivors of any epidemic will be on the whole more resistant than the population in which the epidemic impinged. According to the intensity, duration, and frequency of epidemics the population will become more and more resistant. Such, at any rate, seems likely, though it is hardly possible to prove, from human experience alone, that this process actually operates.

Progressive selection by an infection should be easier to demonstrate in small animals: first, because they breed quicker and many generations may come within individual human experience; secondly, because in them sickness generally means death and in consequence the surviving population is not diluted with the offspring of survivors who have acquired individual immunity which is not inherited. Selection under



wild conditions is presumably more intense than when it is interfered with by nurses and doctors, and it seems that a very clear selection of this type has taken place among the rats of Bombay City since plague broke out among them 32 years ago, as may be learned from the very interesting account given by Lieut.-Colonel F. P. Mackie, I.M.S., in the report of the Haffkine Institute for 1927. Plague was introduced into Bombay in 1896 and assumed severe epidemic proportions in the following year. During each of the next seven years from 13,000 to 20,000 people died. After 1905 there was a rapid decline which has gone on progressively and almost regularly till the human deaths in 1926 and 1927 were only 56 and 207. There is no means of measuring with any accuracy the extent and intensity of the corresponding rat epidemics, but it is reasonable to suppose that they have run fairly parallel with the human outbreaks. During this period the resistance of wild Bombay rats to artificial inoculation with plague bacilli has been measured from time to time, with the striking results shown in the table. The conditions of such experiments can scarcely be sufficiently standard to justify minute numerical analysis, but the broad conclusion seems plain—that a given dose of bacilli will now kill only one-fifth of

the number of rats which it would have killed at the beginning of the century. The experiments made in 1910–12 and in 1926–27 have all been controlled by inoculating simultaneously an adequate sample of wild rats from Madras City where plague has never gained a foothold; 95 to 98 per cent. of this unselected

Year	Percentage dying from the test dose of plague bacilli.	Animals tested.	Year	Percentage dying from the test dose of plague bacilli.	Animals tested.
1904	93	111	1912	24	300
1906	95	577	1926	18	848
1910	54	648	1927	18	1407
1911	33	1200			

population died from the test dose. It was also shown by the Advisory Committee in 1910–12 that the young rats bred in captivity from wild Bombay rats were as resistant as their parents.

The present condition has been achieved by 32 epidemics; it is not much different to the position in 1912 after 16. Just how often rats breed in nature is unknown—probably two or three generations a year—and as plague epidemics are annual some generations would escape selection. Roughly speaking, one may judge that immunity is about doubled in 30 to 40 generations. In man this would mean about 1000 years, and as a matter of fact the time has come only lately when any such mass immunity to plague in the people in India might be expected to begin to have an effect. It will be a matter of the most intense epidemiological and biological interest to see whether, after plague has finally died out, the Bombay rats continue to be resistant or whether they will gradually deteriorate to the level of their cousins in Madras.

CRANIAL AND INTRACRANIAL HÆMORRHAGE IN INFANTS.

THE relation of cerebral birth-injury to the nervous diseases of childhood is a problem which remains as controversial as ever. The attempt to correlate the results of autopsies on infants dying of cerebral hæmorrhage with the signs and lesions of children suffering from spastic disorders has so far accomplished little, and the whole question is still in the realm of speculation rather than established fact. Further progress is most likely to come from following up cases which have been thoroughly investigated at birth, and Dr. Donald Munro,[1] of Boston, has lately described an attempt of this kind based on 117 cases over a period of seven years. Whilst his paper includes some objective observations which are of great interest and value, the reader is likely to be impressed by the extreme difficulty of the whole question, and will be wise to adopt an attitude of caution in interpreting the results in terms of causation. The series comprises cases in which a diagnosis of cranial or intracranial damage, including œdema, was made, the basis of the diagnosis being an increase of cerebral pressure (in the absence of surgical shock), in conjunction with such symptoms as cyanosis, refusal to suck, hypertonus, and respiratory abnormality. Of the total 117, no fewer than 54 were first-born infants. Fifty-six died of immediate effects, whilst 58 were discharged as relieved or improved. At post-mortem macroscopical examination hæmorrhage was found in the great majority of the fatal cases, but congestion and œdema alone were found in others, these corresponding to the ones that Munro classified during life as "asphyxial" rather than traumatic. On microscopical examination, however, the asphyxial cases also showed evidence of hæmorrhage, which was usually intra-cortical. The gross traumatic lesions were most often found in the vena magna Galeni or the lateral sinus. Of the 58 babies discharged, all but ten were traced up to December, 1927. Eleven had died, including three with hydrocephalus and one with spastic idiocy; the other seven died of some intercurrent disease. Of the remaining 37, 25 were normal at the end of 1927; 9 were normal when last seen, and 3 suffered from hydrocephalus or convulsions. Munro has presented his results in the form of tables in which the various clinical types are compared, and his deductions depend somewhat closely on this classification. It is to be feared that this fact will increase the difficulty of correlating his painstaking work with that of other investigators. Cases are divided into three groups—traumatic, asphyxial, and hæmorrhagic. He assumes that asphyxia is a cause of hæmorrhage, explicitly attributing one group (16 cases) to it, and therein he may be accused of begging an unsolved question. The assumption is one which most of his fellow workers would probably not accept, for the exhaustive reviews which have appeared in recent years—notably the monographs of H. Ehrenfest and F. R. Ford—indicate that the balance of opinion is opposed to accepting asphyxia as a causal agent, though it may be predisposing or contributory. Moreover, the experimental work on kittens done by Ford, to which we drew attention last year[2] cannot fail to strengthen scepticism about this alleged causal factor, and Munro's figures would have had greater value if so doubtful a major premise could have been eliminated. Of the positive findings in the surviving cases, the outstanding feature is the incidence of hydrocephalus. One of the author's conclusions is that "the most common late result of cerebral damage in the new-born is hydrocephalus associated with either epilepsy or idiocy." The possibility of the hydrocephalus being a late result of a prenatal defect should not, however, be overlooked, and that this is usually so is the considered opinion of W. E. Dandy, Ford, and many other authorities. On the other hand, Munro's view is supported by John Fraser and Norman Dott, who believe that intracranial hæmorrhage plays an important part in the ætiology of hydrocephalus. We hope that in his next communication Munro will deal fully and critically with some of these interesting questions of cause and effect.

[1] Surg., Gyn., and Obst., November, 1928, p. 622.

FILARIASIS IN OCEANIA.

A MEMOIR, by Dr. P. A. Buxton, on a research expedition into Samoa, Tonga, the Ellice Group, and the New Hebrides in 1924–25 was published in July, 1927. This memoir was principally concerned with the entomology of these lands. He has now published a study[3] of filariasis as it exists in Oceania. In his general scheme of study of filariasis in Samoa and adjacent island groups Dr. Buxton has pursued the methods used by his predecessors engaged upon the same work in that area, but his statistics are more searching and have been calculated on more strictly mathematical lines. Filarial infection in Oceania is rare in childhood. From the age of 11 its incidence rises steadily, and in Samoans reaches 50 per cent. in the age-group from 26–35 years. No constant difference is found in the microfilarial count between those males with, and those without, enlarged epitrochlear glands, and there is no consistent difference in count between communities in which the epitrochlear rate is high, moderate, or low. In other words, *Filaria bancrofti* either produces embryos in the blood and no epitrochlear gland enlargement, or it produces an epitrochlear enlargement, but its microfilariæ fail to reach the blood stream. The glandular signs of filariasis increased with age. Enlargement of the epitrochlear gland was observed in 48·5 per cent. of Samoan males otherwise normal.

[2] THE LANCET, 1928, i., 665.

[3] Researches in Polynesia and Melanesia. An account of Investigations in Samoa, Tonga, The Ellice Group, and the New Hebrides in 1924-25. Parts V.–VII. (Relating to Human Diseases and Welfare). By Patrick A. Buxton, M.R.C.S., D.T.M. & H., formerly Milner Research Fellow; Director, Department of Entomology, London School of Hygiene and Tropical Medicine. Published by the London School of Hygiene and Tropical Medicine. 1928. Pp. 137 and plates. 9s.

Myositis, with multiple abscess formation, which is common amongst the Samoans, but absent in the Ellice, Tokelau, and Gilbert Islands, is not regarded by the author as of filarial origin. Amongst the genital signs of filariasis are marked fibrosis of the testes, epididymiitis, and hydroceles, which are commonly antecedents of elephantiasis in scrotums. Allowing for all the difficulties attendant on the proper study of filariasis, the author concludes that filarial infection is an essential precursor to elephantiasis, but that the exact position of the filaria itself in the pathology of the disease is obscure, at least in Oceania. The common filarial infection of tropical Asia, due to *Filaria bancrofti* with a nocturnal larva, extends eastward and prevails in New Guinea and throughout Melanesia, but the insect vectors in these regions are unknown. In Fiji and Polynesia the filaria with non-periodic larvæ is found, and throughout its area the vector is *Aëdes variegatus*. Certain facts probably account for the absence of the periodicity of microfilaria east of long. 170° E. Even where the microfilaria is nocturnal, the periodicity is not absolute, and a few larvæ may be found in the blood during the day; and it is probable that the non-periodic habit is in some way influenced by the presence of *Aëdes variegatus* in the islands east of long. 170° E. This particular line is of importance in the œcology of the Pacific. West of it the people are Melanesian, malaria prevails, and the microfilaria is non-periodic. Filariasis in Samoa resembles that of Fiji closely, especially in the rarity of lymph scrotum, lymphuria, and chyluria.

Dr. Buxton is to be congratulated on having brought to a successful conclusion a fine piece of work which, in addition to much valuable material, provides matter for further reflection. He deals not only with filariasis, but also with yaws, leprosy, dysentery, and helminthic diseases as seen in Samoa. Part VII. of his monograph is concerned with brown man and white in Samoa, and is an anthropological study of considerable ability, giving an outline of history, customs, and communal life of the people.

CHRONIC APPENDICITIS.

CHRONIC appendicitis is evidently as big a problem in America as it is here, if two recent papers may be taken as a guide. Andresen's [1] conclusions are based on an analysis of 3500 gastro-intestinal cases, and he deplores the results of "misdirected enthusiasm" for unnecessary and ill-directed surgery which has resulted in "thousands of individuals who have not been benefited by appendicectomy." His view is that the structure of the normal appendix (its cilia, its musculature, and the valve of Gerlach at its outlet) is such as to prevent the entry of cæcal contents. Thickening of the wall by inflammation interferes with normal function, cæcal contents enter, and the efforts of the appendix to expel the irritating mass formed by stagnation and desiccation may be the cause of so-called appendicular colic. The appendix does not live for itself alone, and as a rule "chronic appendicitis is only a part of a generalised chronic infection of the whole gastro-intestinal tube and its appendages." In Andresen's series of 586 cases lesions of other organs were demonstrable in 556—that is, 95 per cent. The frequent association of infected tonsils and teeth with chronic disease of the appendix is noted, and also the rarity of concomitant pelvic foci in the female. Diagnosis is difficult, for the symptoms are not characteristic and are readily masked by those arising from the frequent coexisting infection. Similarly, Andresen points out that physical examination is often misleading, and this is undoubtedly true, though we do not think it applies to palpation of an appendix seen on the X ray table. He doubts whether a normal appendix will fill with a barium meal, though it may with an opaque enema, but here again the statement must be qualified, for E. I. Spriggs and O. A. Marxer have shown that if buttermilk is used as a vehicle for the meal, after careful preparation, appendices will fill which otherwise appear impermeable. While reference is made in Andresen's paper to the significance of delay in emptying of the appendix, spasm is not mentioned, though it is a valuable sign, especially if occurring early; the indirect evidence gained by radiographic examination is carefully considered. The general conclusion reached is "that a diagnosis of chronic appendicitis does not necessarily mean . . . an operation." Medical treatment is general (treatment of any coexistent infection or foci) and local. The latter includes dieting with "a normal rough diet" to stimulate the cæcum, meat being taboo; mineral oil is used if required, and general hygienic measures are taken. Such treatment he regards as efficacious and would limit surgery to complications such as kinks and adhesions. Carnett and Boles [2] agree with Andresen about the number of useless operations and in regarding the appendix as only one factor at fault, for they find a constitutional element in many of their cases. The chronic changes seen in the appendix seem to them largely due to a normal evolution and not to disease. Mistakes, in their opinion, arise from confusion of parietal with visceral pain, for they place much of the so-called appendix pain and tenderness in the abdominal wall itself, attributing it to an irritative lesion of the lower intercostal and first lumbar nerves, secondary, as a rule, to a spinal arthritis or malposition. Non-operative treatment is advocated, particularly orthopædic supervision of the vertebral column and adjacent parts. "Patients as a whole would be better off by complete abandonment of appendicectomy for so-called chronic appendicitis." The views reflected in these two papers seem then to be as follows: diagnosis is difficult, treatment must not be limited to the appendix, many useless operations are performed, and there is no one indication on which the surgical result can be foretold. With these views we agree, but would add that cases do occur in which a simple appendicectomy relieves the symptoms. The difficulty lies in recognising such cases.

[1] Medical Aspects of Chronic Appendicitis, by Albert F. R. Andresen, Amer. Jour. Surg., October, 1928, p. 372.

THE NEW FOOD AND DRUGS LEGISLATION.

WHAT used to be known as the Sale of Food and Drugs Acts, 1875 to 1927, were repealed last summer (together with certain amending provisions such as, for instance, those contained in the Milk and Dairies (Consolidation) Act 1915) and superseded by the Food and Drugs (Adulteration) Act, 1928. The new Act takes effect as from the beginning of the year 1929, and will be found a convenient statement of the law in the form of a single orderly document. Two points perhaps should be emphasised in respect of it. In the first place, for drafting reasons, the new Act labels the local authorities which have to administer its provisions as "food and drugs authorities"; the officers who are empowered to take samples are labelled "sampling officers"; these are merely verbal alterations; in other respects there is no change in the law. The second point is that, as usual in a consolidating statute, the repeal of the older enactments is not to have the effect of repealing the regulations made thereunder. This means that the Public Health (Preservatives, &c., in Food) Regulations made by the Minister of Health in 1925 and subsequently amended in 1926 and 1927 are still in force though in part made under the Acts now superseded. These Regulations have also now been printed in the form of a single consolidated document, but there are passages which read awkwardly because of references to the repealed Acts. It would have been preferable to reissue a new code of Regulations without these difficulties even if the awkwardness is not serious. For instance, when Article 6 of the Regulations says that the Sale of Food and Drugs Acts, 1875 to 1907, shall apply to a sample, the reader has to make a

[2] Fallacies concerning Chronic Appendicitis. By John Berton Carnett and Russell S. Boles. Jour. Amer. Med. Assoc., 1928, xci., 1679.

mental substitution and remember that it is now the 1928 Act which is to apply. And, when the Regulations go on to say that Section 14 of the 1875 Act and Section 13 of the 1899 Act shall apply to an analysis, it is now Section 18 (1) of the 1928 statute which is applied.

The Ministry has issued to food and drugs authorities a memorandum on the procedure under the Act explaining the formal differences in the new law and drawing attention to the statutory reports required. It should perhaps be added that the 1928 statute does not apply to Northern Ireland except in so far as it deals with importation. Matters connected with importation and the customs are not within the power of the Belfast Parliament, but with this exception the law of the sale of food and drugs is a matter with which that Parliament is competent to deal.

RADIOPHYLAXIS.

THE strength of growth of lentils germinated on wool at laboratory temperature can be gauged fairly accurately by the growth of the roots. Two investigators [1] in France have taken advantage of this fact in an attempt to discover whether a small dose of radiation has any effect upon the reaction to a large subsequent irradiation. Using 30 Rontgen as a preliminary dose, followed by 450 R. at a later date, and with all experiments controlled, they have come to the conclusion that the small initial dose definitely checks the action of the subsequent larger dose. In all they have made 48 experiments, from which they conclude that there is a definite phenomenon of "radiophylaxis" which seems to account for the apparent non-cumulative action of broken doses in certain experiments that have been detailed by other workers. The bearing of these facts on the application of radiations to the human subject is not necessarily obvious, for we do not know that the response of animal and vegetable cells to radiations is the same. If the parallel could be accepted, it would suggest that the greater efficiency of radiation treatment will be in the direction of massive doses rather than in the fractional dose method now so generally employed. Many of the older workers, however, are convinced of the greater efficacy of the oft-repeated small dose as against the massive dose, so that it seems reasonable not to draw conclusions from botanical experiments until these have been corroborated by similar or parallel experiments on animal tissues. It may be that the well-known latent period of 10 to 20 days in the action of radiations on the human subject has not time to develop in the more rapidly growing cells of the plant.

THE DANGER OF HIGH-TENSION CURRENT.

THE tragic death of a child while undergoing an X ray examination at a hospital recalls attention to the constant need of watchfulness when electric current of high potential is used for the purposes of medical diagnosis or treatment. The evidence given at the inquest is summarised in our medico-legal column. The coroner's jury returned a verdict of accidental death and imputed no culpability to anyone present in the X ray room when the accident occurred. It was accepted by the coroner as scarcely doubtful that the danger zone of the apparatus had been encroached upon by the unfortunate position of an attendant who must unwittingly have placed herself in what was an ideal position to form a complete electric circuit, which when completed was sufficient to electrocute the child. The danger is one which cannot at present be eliminated by mechanical contrivance alone. If the X ray tube is above the couch, as it may be for diagnosis, and must be for treatment, it is practically impossible to eliminate risk entirely, although the risk can be reduced by protecting the cables from accidental contact with anyone who is attending the patient. To surround the cables with cages right down to their connexion with the tube would impede the free movement of the tube which is essential for accurate diagnosis. When the X ray tube is above the couch the cables joining it to the coil or transformer rise from it to the overhead cables, and they cannot be placed out of reach or removed from the possibility of being touched by anyone who is not aware of the danger. A nurse, for instance, might be close to one of these cables, and the patient might raise an arm and bring it near the X ray tube when a spark would be likely to pass through the intervening air gap. The cables must be light and, therefore, cannot be perfectly insulated with any material at present known. The risk is of smaller degree when the tube is underneath the couch, for the cables can then be kept out of reach of careless hands. If the tube is worked from a coil death from electric shock is very unlikely to occur, but in a large proportion of the high-power apparatus now installed the tube is worked from a transformer, when the risk is much greater. In speaking thus of greater or smaller risk it should, of course, be borne in mind that the risk, though present, is very small indeed, and accidents of any kind are very infrequent. Mechanical perfection in the apparatus and the increased training and experience of radiologists and their technical staff has happily reduced the risk to a very small compass, but this fatal accident will have served a useful purpose if it has reminded all who have to do with such electrical installations that they are dealing with lethal weapons in which the human element is still present and that care and watchfulness must never be relaxed.

[1] Angel, P., and Lallemand, Suzanne: Compt. rend. de la Soc. de Biol., 1928, xcix., 1588.

CANCER MORTALITY IN IRELAND.

WITH the single exception of Switzerland, every country in Europe has recorded increasing rates of mortality from cancer during the last 40 years. In spite of these records there are some who doubt that any actual increase in prevalence has occurred. At a recent meeting of the Section of State Medicine of the Royal Academy of Medicine in Ireland, the President, Prof. Joseph W. Bigger, advanced the proposition that there has been no increase in cancer mortality in Ireland in the last 50 years—supporting his argument by means of tables projected on the screen. The first of these compared certain statistics of 1875 with those of 1925, and established the fact of a decrease in the general death-rate, the infantile mortality-rate and the infectious disease death-rate, associated with a rise in the percentage of total deaths which occurred over the age of 45 years. The second showed a higher proportion of persons aged over 45 years in the population in 1925 than in 1875. Death was ascribed to cancer at the rate of 33·2 per 100,000 living in 1875, and 94·2 in 1925, the increase being chiefly in the age group 45–65 years. Certain other diseases, including ulcer of the stomach and intestine, hepatitis, jaundice and diseases of the liver, ascites, atrophy, and debility, which were common causes of death in persons aged over 45 years in 1875, had greatly decreased or even disappeared in 1925. Prof. Bigger calculated how many deaths from these conditions would have occurred in Ireland in 1875 if the 1925 rates had prevailed, and deduced the excessive deaths from each of these causes in 1875. He argued that a proportion of these excessive deaths (in persons aged over 45 years) were really due to cancer, assessing the proportion at from one-eighth (in enteritis) to one-third (in ascites). These presumed cancer deaths he then added to the actual records of 1875. Turning to "senility" as a certificated cause of death, he pointed out that comparing the later year with the earlier, the deaths so attributed had been greatly reduced, while the number of old persons in the population had increased; 52 per cent. of deaths of persons aged 65 to 75 years were ascribed to senility in 1875, 20 per cent. in 1925. Calculating as before the excess of these deaths in 1875 above what would have been recorded at the 1925 rate, and assuming that certain fractions of this

excess were really due to other causes, Prof. Bigger obtained a further quantum of deaths (recorded as due to senility in 1875) which were probably due to cancer. After applying these corrections to the recorded cancer deaths, the true cancer death-rate for 1875 works out at 95·2, a figure nearly identical with that of 1925. Prof. W. D. O'Kelly, in opening the discussion, asked if cancer was merely increasing because so many people were going into the towns; he assumed that it was a disease of civilisation. Criticising Prof. Bigger's redistribution and the causes of death in 1875, he thought that a large proportion of those attributed to senility would now be regarded as due to heart disease, pneumonia, or bronchitis. Cirrhosis of the liver would absorb a large number of the deaths from ascites ascribed by Prof. Bigger to cancer. Sir John Moore remarked on the part played by surgery in enabling the diagnosis of cancer to be verified before the fatal onset, and on the prolongation of life due to the gradual subsidence of some of the more dangerous epidemic diseases, which permitted the population to live to an age when degeneration due to cancer manifested itself. Dr. W. M. Crofton thought that if the death-rate figures of some easily diagnosable condition such as cancer of the breast or tongue were compared there would be little or no difference between 1875 and 1925. Prof. Bigger, in summing up, said he did not believe that civilisation played any considerable part in the production of cancer; there was, he thought, no great difference in the prevalence of cancer in country and town. A friend of his in East Africa wrote that he had done 12 operations for cancer on natives, thus dispelling the theory that native races are immune. He agreed with Sir John Moore that one reason for the apparent increase in cancer was the prolongation of life owing to the diminution or almost complete disappearance of small-pox, typhus, typhoid, and other infectious diseases. It was difficult, he thought, to place reliance on registration records of deaths in the old days; the improvement in registration of recent times was due to increased medical knowledge among Irish practitioners and dispensary doctors.

HEALTH INSURANCE CHANGES.

THE New Year sees some important changes in the administration of the National Health Insurance scheme, the effect of which will be to simplify its working. Reference to these is made on p. 46. The first change concerns the regulations governing the calculation of arrears in payment of contributions while the insured person is out of work. Certain penalties to be enforced when arrears had lasted so-and-so many weeks are abolished by the new Act, this concession to genuine unemployment being rendered possible by an annual grant out of the Stamp Sales Account. Difficulty in determining whether the unemployment is genuine or not may require the production of certificates by officials of the labour exchanges. Another important change is an extension of what is known as the free year, which is lengthened to 21 months. At the end of this period the approved societies will have sufficient evidence before them to show whether an insured person is entitled to a further period of 12 months' insurance on account of unemployment. The effect of these new provisions will be greatly to diminish the number of notices issued and of complaints which arise from the reduction or suspension of benefits. A voluntary contributor who ceases to pay contributions will remain insured for a period of approximately 21 months as in the case of an employed contributor who ceases to be employed. There will, however, be no further extension, as in the case of an employed contributor, if a voluntary contributor becomes genuinely unemployed; but in this case also sickness will lead to extension of the free year. The provisions relating to deposit contributors are altered very considerably. The fund is divided into two parts, a deposit section and an insurance section. Any deposit contributor may on application be transferred to the nsurance section on two conditions: (1) application must be made within a prescribed time and in a prescribed manner, and (2) the applicant must prove that the state of his health is such that he cannot obtain admission to an approved society. If his health improves he must try to obtain admission or failing this he may be reinstated in the deposit section. To provide funds for sickness benefit in the insurance section certain transfers will be made from moneys accruing from interest on the whole funds of the section or amounts standing to the credit of deposit contributors upon death or emigration. There are certain changes relating to the sickness benefit of married women; one such provides that a woman shall not be suspended on marriage where unemployment is due to inability to obtain work; another increases the amount of sickness benefit payable and alters the conditions to some extent.

Alterations in additional benefit chiefly affect the approved society administration and the determination of disposable surpluses. New additional benefits are these:—

(1) The provision of specialist treatment, not being treatment within the scope of medical benefit or any other additional benefit.

(2) Payment to approved charitable institutions in respect of treatment of members.

At the same time certain additional benefits are repealed — namely: (1) medical treatment and attendance for dependents of insured persons; (2) payment of disablement allowance to members not totally incapable of work; (3) payment of pensions or superannuation allowances; (4) payments of contributions to superannuation funds; and (5) remission of arrears.

It must be a continued source of chagrin to all who remain faithful to the health insurance principle that the Economy Act, under which the Treasury grants to insurance funds were reduced, postponed the much-needed laboratory and specialist services. It may be contended that many additional benefits will be available when the sickness claims are reduced, but at the moment we have to face the fact not of surpluses, but for the first time of deficits in many of the funds. The auditor's report for 1927 shows that the total receipts for England were £33,670,000, while the total expenditure on benefits was £30,069,000 and on administration £4,326,000. The English Fund was thus £725,000 to the bad, while the Scottish deficit for the same period was £273,000.

TRANSMISSION OF DISEASE BY TRANSFUSED BLOOD.

WITH the multiplication of blood transfusions in all countries it is inevitable that their dangers should be sometimes emphasised by the occurrence of accidents. The main sources of danger are two: incompatibility of the transfused blood, and diseases that may be transferred with the blood from donor to patient. The first danger is now fairly fully understood, thanks to the researches of Landsteiner and Levine at the Rockefeller Institute and of many others, and it is not often that accidents happen. The transmission of disease also occurs surprisingly seldom when it is realised how difficult it is entirely to guard against it. The two diseases chiefly to be remembered are syphilis and malaria, and it is the duty of everyone entrusted with the task of selecting blood donors rigidly to exclude any individual who could possibly be suspected of harbouring either of them. For the elimination of syphilis the Wassermann reaction must be used as a routine measure, except in an emergency when no tested donor is available. The spread of organisations of voluntary donors in London and the provinces is, of course, gradually eliminating the use of untested donors even when haste is essential. In the earlier days of transfusion several cases were recorded from America in which syphiis was actually transmitted, in one instance from a son to his father; but no case has been published in recent years. Malaria is more difficult to avoid, since there is no test and reliance has

to be placed on the donor's statement that he has never had the disease. The moral of this is pointed by an occurrence described by our Vienna correspondent (p. 44) where a donor, in spite of his statement that he had never had malaria, was proved to have infected four people by transfusions. Other common diseases which have been transmitted in the same way are some of the exanthemata. The transmission of measles in two cases from a mother to her infant was reported from Chicago in 1924,[1] the blood having been taken two days before the appearance of the rash. Small-pox has also been transmitted recently,[2] the blood again having been taken two days before the eruption appeared. The existence of an incubation period must always make the complete elimination of this accident impossible. Much queerer events than these have also been described. On one occasion a patient was temporarily endowed with horse-asthma after having received the blood of an individual subject to this condition.[3] Again, a recent report [4] from Scandinavia records the transfusion of blood from a donor who was seven weeks afterwards found to be suffering from acute myeloid leukæmia, from which he presently died. Fortunately for the patient, if unfortunately for medical science, no symptoms developed in the recipient, so that the question whether leukæmia can be transmitted in this way is still unanswered. It is evident, however, that these accidents are relatively so uncommon that no exaggerated fear need arise in the minds of either the public or the profession. Comfort may also be derived from the statement [5] made in 1925 that the blood of tertiary syphilitics may be safely used for transfusion. It was a somewhat bold experiment, ten non-syphilitic patients being transfused from six syphilitic donors in a late stage of the disease. None of the patients was infected, but the use of such donors is, of course, not to be recommended.

SUPRARENAL TUMOURS IN CHILDREN.

THE exact terminology applied to new growths of the suprarenal glands is often confusing, and in children such tumours are usually so misleading in their clinical manifestations as to render precise diagnoses very difficult. The subject is, however, not really so complicated as is often made out, and a recent report [6] of a case of malignant suprarenal tumour in an infant, with a brief survey of literature, very much simplifies the classification. Tumours of the suprarenal cortex either give rise to no symptoms at all, like the simple adenomas, or produce curious disturbances of sexual development. Tumours of the medulla of the suprarenal are in reality new growths of the sympathetic nervous system, and the term "neuroblastoma" is used for them, or more simply "medullary sarcoma of the suprarenal." These latter tumours are especially liable to cause difficulty, for they metastasise so early that the secondary deposits seem to dominate the picture, while the primary growth may only be discovered at autopsy. Tumours of this variety fall into two groups. The "Pepper" type occurs in babies between six weeks and four months old, usually growing in the right suprarenal, and giving rise to an enormous enlargement of the liver which is diffusely infiltrated with secondary deposits. The "Hutchison" type is, as a rule, found in children between one and five years of age. The primary growth, usually in the left suprarenal, is bigger than it is in the Pepper type, while secondary deposits occur in the bones, especially those of the skull. It is in such cases that difficulty may arise because secondary deposits in the orbit, producing proptosis, may occur before the primary growth is discovered, and the diagnosis from chloroma can often only be made from a blood count. In the paper from which this review is taken van Veen describes a case of the Pepper type in an infant aged only 18 days. The main clinical feature was the huge size of the abdomen due to an enormous liver. Blood count showed a slight decrease in the red cells with an increase in the leucocytes. The van den Bergh reaction in the blood was negative and so also was the Wassermann reaction. The child died at the age of 6 weeks, and at the autopsy the liver was seen to be very large, pale, speckled, smooth, hard, and infiltrated throughout with metastases, while the primary growth was in the right suprarenal with a somewhat compressed right kidney. Dr. van Veen discusses the histological appearance of the tumour and its relationship to the sympathetic nervous tissue. His observations may be correlated with those of Dr. D. M. Greig,[1] who in a paper which has just appeared gives an account of the histological appearances of the Hutchison type, describing fully a case in which there were secondary deposits in the region of the right side of the face and skull. He is interested especially in the nature of cephalic metastases in these cases, and points out that the secondary deposit is in the soft tissues at first and infiltrates the bone later. After a period of bone absorption there is great activity of the bone cells with local excess of calcium salts leading to formation of new bone. This bone cell activity is the direct result of the excess of vascularity which the highly vascular tumour has ensured. In Greig's case the primary growth was in the right suprarenal, which is a slightly less common site than the left suprarenal for the primary focus. He quotes the work of Frew to show that the cephalic distribution roughly follows the side of the primary growth, owing, it is believed, to the anatomical arrangement of the lymphatic drainage of the suprarenal glands.

[1] Amer. Jour. Dis. Child., 1924, xxvii., 256.
[2] Ann. Clin. Med., 1926, iv., 722.
[3] Jour. Amer. Med. Assoc., 1919, lxxiii., 984.
[4] Act. Chir. Scand., 1928, lxiv., 369.
[5] Amer. Jour. Syph., 1925, ix., 470.
[6] Jahrb. f. Kinderheilk., December, 1928, p. 214

HOSPITAL AFTER-CARE AT SHEFFIELD.

ANONYMOUS generosity has made it possible to inaugurate a valuable scheme for after-care and convalescence at the Sheffield Royal Infirmary. There, as elsewhere, it has been felt for a long time by the infirmary board that the work of an institution of 500 beds was incomplete if it ceased automatically when the patients left the wards. It is desirable in the ex-patient's interest that his progress should be carefully watched, his diet supervised, arrangements made for further examination and treatment on the first sign of retrogression; and equally desirable in the interests of posterity that complete records of progress should be available as a guide and control to the treatment of others. We are to-day at a period in hospital development when we must appraise our results more intelligently in order more accurately to register what we are accomplishing. The patient must be followed actually to his home or place of work in order to estimate how his physical condition is standing the strain of normal life. Valuable information will be obtained from an after-care scheme with a well-organised follow-up and a collation of the data so obtained. In the case of the Sheffield Infirmary scheme the primary functions are several, and may be epitomised thus: to gain knowledge of the patient's condition after discharge from hospital; to coöperate with any and every agency with a view to rapid restoration to health; to help the patient to understand the treatment recommended, prescribed, and often supplied by the hospital; to furnish where necessary surgical appliances, artificial limbs, splints, trusses, and the like; to supply drugs like insulin and special diet for diabetics who cannot take the food of the ordinary household. The scheme is drawn up specially with a view to convalescence; in accordance with the wishes of the founders expressed in a trust deed the fullest use will be made of convalescent homes, particularly of homes offering special treatment. The word convalescence is to be construed in its broadest sense, and under this heading will be provided home nursing

[1] Edin. Med. Jour., January, 1929, p. 25.

where needed. The Sheffield Royal Infirmary has for a number of years past employed an almoner in the capacity of inquiry officer and assessor of means. This work will form part of the new after-care department, the registration of patients being one link in the chain which will keep the patient in touch with the hospital from the time of entering it until health is restored. The appointment of women specially trained for this work is under consideration, and it is hoped to open the new department shortly. Sheffield is to be congratulated on the generosity of the two benefactors who have made the scheme possible, and the Royal Infirmary on the foresight shown in the arrangements for making it a success.

RESEARCH INTO ASTHMA.

ON Jan. 15th the Lord Mayor of London will inaugurate a national appeal for funds, to enable the Asthma Research Council to develop a well-conceived scheme of investigation into the cause and treatment of asthma and allied disorders. Since we gave publicity last spring to the aims which prompted the establishment of the Council, its Medical Advisory Committee has been expanded to include men who work in widely separate parts of the country and whose angles of approach to the problem of asthma are even more distinct. Their names are set out in a letter (see page 50), wherein the immediate plans of the Council are summarised. Membership of the Medical Advisory Committee involves not only general counsel but active coöperation, since it is proposed to establish throughout the country research centres, financed by the Council, under the supervision of individual members of this Committee. The Royal Infirmaries of Liverpool, Edinburgh, and Manchester, the Stobhill Hospital, Glasgow, the General Hospital, Birmingham, and the Royal Victoria Hospital, Belfast, have already consented to supply facilities for research on these lines, and other provincial hospitals are considering the question. Laboratory investigations will be carried out at Edinburgh, Bristol, and at King's College Hospital, and St. Mary's Hospital. In London, clinics are being formed at Guy's Hospital under the direction of Dr. H. W. Barber, Dr. R. D. Gillespie, and Dr. Arthur F. Hurst, and at the Hospital for Sick Children in Great Ormond-street, where Dr. E. A. Cockayne will take charge. Both these clinics are financed by the Halley Stewart Trust endowment, which has made a grant of £2500 spread over four years for this purpose. At Guy's the clinic is especially designed to supplement and complete an investigation into the biochemical causation and treatment of asthma which is being undertaken by Dr. G. H. Oriel under the auspices of the Medical Research Council. It is proposed to carry out a controlled survey of the effects of different sorts of treatment on selected cases. The physicotherapy in use at various continental spas has excited the interest of the Council, and under a grant from the British Humane Association Dr. Una Ledingham has been appointed Research Fellow to study technique. She has visited Reichenhall, Mont Dore, Ems, Hamburg, Berlin, and Paris, and is now testing the methods favoured at these centres in this country, on suitable patients, by means of apparatus installed by the British Humane Association. Saline and pine oil inhalations, automatic breathing apparatus, expiratory exercises, nasal gas applications (CO_2), ultra-violet light, and diathermy are all being tried.

The businesslike way in which the Asthma Research Council is setting up a well-designed network of small centres throughout the British Isles deserves high praise. The well-established variations in manifestations and response to treatment of asthma may eventually be correlated with variations in geology, flora, or even clan. Since the climatic factor looms so large if not in the pathology certainly in the treatment of this strange disorder, there is every reason for decentralisation of activities. It is a wholly unexplained fact that while one asthmatic is well only in a warm dry climate, high above sea-level, his brother—sometimes literally his brother—is free from attacks only in low marshy areas. Light may be thrown on these discrepancies in members of families subject to asthma and the curious disorders of the skin and other systems sometimes associated with it, by the questionaire on family history which is being circulated by the Council. Forms have been prepared for the collection of statistics concerning the influence of heredity on the whole asthma syndrome. These forms are available in duplicate in order that control charts of non-asthmatic families may be prepared, and medical men are urged to coöperate in the research by distributing them among their patients. The help of the afflicted may properly be enlisted in order that the £50,000 required for the establishment of investigation centres and the development of research schemes will speedily be raised. The headquarters of the Asthma Research Council is at 42, Ranelagh-road, London, S.W. 1, and it is to this address that inquiries should be directed and donations sent.

Mr. John Humphrey Plummer, of Southport, has left about £250,000 to the University of Cambridge in order to endow two chairs for the promotion of modern scientific research.

THE annual congress of the Ophthalmological Society of the United Kingdom will be held in London from Thursday to Saturday, April 11th–13th. On the Thursday, at 2.30 P.M., Mr. E. Maddox, Group Captain Cecil Clements, and Mr. Charles Goulden will open a discussion on Heterophoria, and on the Friday, at 8 P.M., Sir Arnold Lawson, Dr. R. A. Young, and Mr. S. A. Browning will speak on the Diagnosis and Treatment of Ocular Tuberculosis.

THE City of Cardiff is about to lose the services of the medical superintendent of its mental hospital, Dr. Edwin Goodall, who has decided to retire from active work there in April. The hospital was Dr. Goodall's own creation, for he came to Cardiff from the Carmarthen Mental Hospital in 1906 to supervise the preparation, furnishing, equipment, and staffing of the new City Asylum, which was opened in 1908. Under his direction the institution has acquired all the equipment considered necessary for the up-to-date mental hospital. There is a full staff of visiting specialists, a radiological and ultra-violet installation, an operating theatre for general and special surgical work, and a hydrotherapeutic department. Nearest to Dr. Goodall's heart is the biochemical laboratory, built in 1910, at a time when biochemistry was associated with psychiatry in the minds of only a very few. It is equipped with sterilising and instrument room, bacteriological apparatus, and a department for physiological research, and over 50 original papers have been published by its staff, recent work including research into phosphorus, calcium, and cholesterol in the blood, and basal metabolism in mental disorders. Nor has Dr. Goodall neglected pioneer work in the treatment of early mental disorder, for he has been physician in charge of the psychiatric out-patient clinic at the Cardiff Royal Infirmary since its inception, and he has exerted himself in the field of legislative reform. During the war his institution became a hospital for wounded soldiers. The City Mental Hospital is happy in retaining Dr. Goodall's services as a consultant.

BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.—The seventh congress will be held in Dublin from April 24th to 26th, under the presidency of Dr. Gibbon FitzGibbon. The chief subject for discussion will be Disproportion, but there will be papers on many other subjects besides, and an exhibition of pathological specimens will be arranged. It is hoped to have a representative gathering from all parts of Great Britain and Ireland, and those wishing to take part should communicate as soon as possible with either of the joint honorary secretaries, Dr. Bethel Solomons and Mr. Gerald Tierney.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XVII.—THE INTERPRETATION OF BREAST HISTOLOGY.

WITH ILLUSTRATIVE PLATE

Facing p. 11; Legends to Figures on Plate on p. 11.

A CLINICIAN seeks the services of a pathologist in two circumstances: first, to report upon the condition of the breast and tissues after operation with the objects of confirming the diagnosis and of ascertaining the distribution of disease with a view to prognosis, or to the necessity or not of further treatment; and secondly, for the purposes of making a diagnosis when the clinical signs are not sufficiently definite to ordain the particular line of treatment. In this article features of outstanding importance are demonstrated which should enable a clinician to follow the descriptions of the pathologist. The clinician must not infer—under these circumstances—that the parts of a breast that were not removed are in the same state as those that were removed. It may happen that the early carcinoma of a cystic breast may exist in the parts left behind.

In order to obtain the best results the pathologist and clinician should work together in the closest coöperation. If possible they should examine the patient together before operation, and after it the pathologist should remove the portions of tissue he requires for his examination and report. If this desirable course is impracticable the clinician should give the pathologist as complete a clinical report of the breast and patient as he possibly can. Invaluable pathological reports are based upon whole microscopical sections of the entire parts removed. I have carried out the method of cutting whole sections for 25 years, and my knowledge is based chiefly on this method, but as yet it has not been generally adopted. Where the method of cutting whole sections is impracticable it is well to get as near to it as possible by means of smaller ones. When only that segment of the breast has been removed which contains the localised nodularity, or lump of doubtful nature, the wound should be immediately and thoroughly washed out with a 1-1000 watery solution of perchloride of mercury, to kill any epithelial cells that may have been squeezed out during the process of excision, and to prevent transplantation of carcinoma cells in the event of the lesion being malignant. This lotion should be used even if the parts were removed by diathermy.

In order to guide the clinician a pathological report upon a breast lesion should include the precise state of the epithelium and connective tissues. The report should be arranged on the following pattern by dividing it into two categories: (1) the state of the epithelium, and (2) the state of the connective tissue.

THE STATE OF THE EPITHELIUM.

The state of the epithelium will be discovered to be among the three classes: (*a*) genetic, (*b*) desquamative epithelial hyperplasia, and (*c*) dysgenetic epithelial hyperplasia. Hyperplasia of this type is a tumour immediately the process begins.

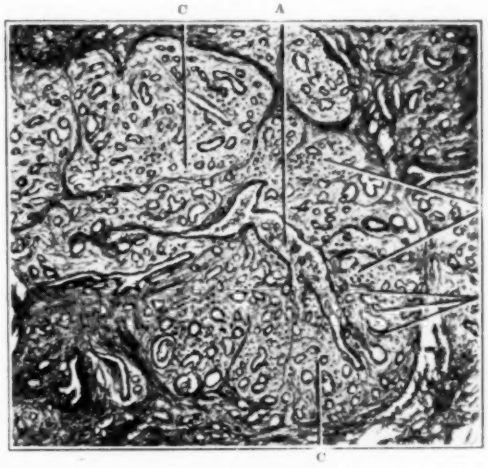
(*a*) *Genetic.*

This class includes all normal epithelial hyperplasia. The morphological appearances of all breasts at birth (male and female), at puberty, and in pregnancy and lactation bear very close resemblances to each other. In all these conditions new ducts and acini are being formed, and these epithelial new formations are always accompanied by hyperplasia of the pericanalicular and periacinous connective tissue. Lymphocytes are often seen among the fibres of the latter tissue. Whenever the breast appears normally active, the epithelium and the pericanalicular and periacinous connective tissue take part in that activity.

The development of breasts is incomplete at birth in both males and females; the morphological appearances are chaotic and variable at this age. Sometimes the epithelial columns that dip down from the skin and penetrate and branch amongst the subjacent connective tissues look very like carcinoma. At others places the hyperplasia of the pericanalicular and periacinous connective tissue appears like a highly extravagant condition of what is commonly called "chronic mastitis."

At puberty and lactation the same tissues are active, but in a much more orderly form than they are at birth. It will always be impossible to understand the condition now described as "chronic mastitis" until it is realised how closely the changes at puberty and lactation (Figs. 1 and 2) are imitated and reproduced in "chronic mastitis" (Fig. 3). A breast in this condition has a marked physiological relation to active normal breasts, and this relation will be made clear when this subject is being discussed (see below). A breast in chronic mastitis is merely one in a state of activity when it should be at rest. The development and formation of the common fibro-adenomata in breasts at puberty will also be more fully understood when its fabric is compared to those tissues which are undergoing physiological hyperplasia in the same breast at the same time.

FIG. 3.



Lobule of a breast suffering from mazoplasia. A, duct full of irregular-shaped, badly staining shed epithelial cells. The acini are also full of shed epithelium. At B there are some newly formed acini. C, pericanalicular and periacinous connective tissue which has undergone hyperplasia in which many lymphocytes can be seen. Strands of the supporting connective tissue of the breasts can be seen separating adjacent lobules from each other.

(*b*) *Desquamative Epithelial Hyperplasia.*

Epithelial hyperplasia is desquamative when the process ends in the shedding from the surface of the epithelium of cells which are incapable of separate existence and of multiplying, and which finally die. The process is normal in development, in puberty, in pregnancy, and during lactation. It is pathological in two types: (*a*) in *mazoplasia* ("chronic mastitis"), and (*b*) in *cystophorous hyperplasia*. I consider the separation of mazoplasia from cystophorous hyperplasia to be of great importance. They are different

processes; they can exist as independent conditions; neither of them has any connexion with "chronic inflammation." Mazoplasia is an unimportant state in its relation to all other tumours except—like puberty—to fibro-adenoma. It is a very common state, sometimes producing pain during life, and it can be frequently seen in breasts post mortem, where no complaint of pains had been made during life. It cannot be regarded as being in an important relation to carcinoma and papillomata. On the other hand, cystophorous hyperplasia is a cyst-forming condition related to tumour developments, and is a definitely pathological state.

Mazoplasia (chronic mastitis).—This condition has no possible ætiological connexion with an inflammatory process, and I therefore propose to give it the new name of mazoplasia.

In mazoplasia the acini and terminal ducts throughout the breast are filled with desquamated, small, irregular-shaped, badly staining epithelial cells. As in the normal active states of the breast there is also a hyperplasia of the pericanalicular and periacinous connective tissue, among the fibres of which lymphocytes may be common or absent. New acini may form in the lobules. The state resembles the breast at puberty also in another respect. The fibro-adenoma that is a typical tumour in a breast at puberty is very liable to occur in the state of mazoplasia, and new acini may form in the fibro-adenomata of both conditions. The fibro-adenomata of puberty and mazoplasia consist of an enormous and more or less local hyperplasia of the pericanalicular and periacinous connective tissue.

The anterior and posterior surfaces of the actual breast in mazoplasia are smooth on palpation. The nodularity of the cutaneous surface on which the diagnosis of "chronic mastitis" is so often made (and is commonly supposed to be so typical of the condition), is due to the fact that the terminal branches of the ligamenta suspensoria enclose fat lobules which, on palpation, give rise to the sensation of multi-nodularity of the surface of the gland. The multi-nodularity completely disappears if the branches of these ligaments are cut across by undercutting the skin, and it is not caused by a nodularity of the gland itself. A large amount of fat between the breast and the skin masks clinical signs in the breast and hides localised true nodularity and lumps of the gland where, in thin breasts, they would be palpable. The picture seen of mazoplasia in Fig. 3 need give no grounds for anxiety except for the possible formations of fibro-adenomata. It may last for years and is likely to cease after the menopause. Mazoplasia does not end in cyst formation, and cannot be regarded as a proemial state of—or as a prelude to—carcinoma. The generalisation of the pain in these breasts is the only important symptom of mazoplasia, and hence, for the purposes of diagnosis and prognosis, is not a symptom that suggests anything more dangerous. Focal pain at one part of one breast is a much more serious symptom, whether it appears alone or in a localised nodularity in either a thin or fat breast.

Transillumination of the breast, recently proposed as an aid to diagnosis in breast lesions by Max Cutler, of New York, is a valuable help. In normal breasts and in mazoplasia the Cameron light renders the gland translucent. Any localised shadow shown by transillumination indicate the presence of a tumour. Cysts, however, are translucent and cannot be differentiated from the rest of the breast by transillumination.

Cystophorous Hyperplasia.—In the cyst-forming type of desquamative epithelial hyperplasia the morphological appearances are distinct from those of any other lesion in the breast. The appearances are so peculiar that they have been mistaken by others for the sweat glands of the skin. I am sure they are true breast structures, and can always be connected up with normal breast ducts by making serial sections.

The cystic dilatations are caused by the desquamative epithelial hyperplasia which occurs in the acini and terminal ducts. At A in Fig. 4 the process can be seen occurring in a transverse section of a terminal duct in which large shed colostrum-like cells are arising in all stages of formation from the epithelial wall. The acini into which this duct leads are also in a state of desquamative epithelial hyperplasia (see Fig. 4, B and B_1). In some parts the cells are feathery and in others more stunted. In the acini the hyperplasia is often a little more than one of mere desquamation and in parts small papillomata have formed as well. At other parts, before the epithelial cells are finally shed they have piled themselves on the top of each other to form columns of epithelial cells only.

The morphological appearances are so typical that there should never be any doubt about the diagnosis. One terminal duct and its acini may be affected only (see Figs. 4, 5, and 6). The whole of only one duct and its branches and acini may be affected and occupy a whole segment of a breast or many terminal ducts, and acini may be affected and scattered with no particular arrangement about the whole of the gland. The state may be unilateral or bilateral. The confluency of affected acini form the common large cysts of the breast.

Dysgenetic epithelial hyperplasia can be detected occurring in cystophorous hyperplasia (see Figs. 5 and 6), a fact which at once converts the latter into one of more potential importance than mazoplasia by showing it is one that is a prelude to more dangerous types of epithelial hyperplasia. In small cysts the epithelial hyperplasia is more active than in the large ones.

There must be such stagnation of contents in the cysts as would allow a contained irritant to act undisturbed and for a long time; this may be the explanation of a harmless type of epithelial hyperplasia developing into one that is dangerous. Whether this be the explanation or not, there can be no doubt about the fact that tumours—papillomata and carcinoma—arise in the cysts as additional complications. I regard cystic breasts as proemial to these complications, and are very likely to contain one or more examples of tumour formation. For instance, I have discovered carcinoma in seven cystic breasts in which its presence was not even suspected, and in others a variety of tumour-formation.

(c) *Dysgenetic Epithelial Hyperplasia.*

Epithelial hyperplasia is dysgenetic when it results in the pathological formation of living cells which are capable of multiplying. Dysgenetic epithelial hyperplasia forms a tumour from the moment of its inception and occurs in four separate conditions.

1. The epithelium may more or less retain its normal appearances, although it covers papillomata (see Figs. 6 and 7). Papillomatous formations in the ducts may even develop into a focus of breast glandular structure containing ducts and acini.

There can be no doubt that papillomata may exist for years without any further complication than an intermittent spontaneous discharge of blood from the nipples; in fact they may exist without any clinical signs at all, and be accidentally discovered in association with carcinoma elsewhere in the breast. In spite of the apparently insignificant course this purely papillomatous state may run, I consider it to be a dangerous state for the following reasons:—

There is no clinical sign upon which it can be decided whether there is a single papilloma or whether there are multiple papillomata. To discover a papilloma in one part of a breast does not exclude the probability of others in the unexamined parts of the same breast. When they are multiple they are just as dangerous as the condition of multiple papillomatous adenomata of the large colon which invariably ends in carcinoma. (Lockhart-Mummery and Cuthbert Dukes.) There is a distinct connexion between carcinoma and papillomatous formations. During the development of "tar cancer" in mice it is very common indeed for the area painted by tar to develop benign papillomata before carcinoma becomes established.

For all these reasons my outlook on the discovery of a papilloma is to regard it as a sign of potential—or of the existence of real—danger that demands the removal of the breast. In this connexion it must also be realised that an intermittent spontaneous

discharge of blood from the nipple may be induced by a benign papilloma or by a multiplicity of benign papillomata, by a duct carcinoma, and more rarely by a carcinoma developing from a dysgenetic epithelial hyperplasia in terminal ducts and acini (see Fig. 8).

2. The individual epithelial cells which result from the process may be arranged in a sessile manner unattached to any stalk of connective tissue (see Fig. 5). They may show signs of malignancy by exhibiting nuclear hyperchromatosis, variation in the size and shape of the cells, and mitosis, and I am convinced they are malignant, and yet the process may be still confined within normal boundaries of ducts and acini (Fig. 7).

3. In Fig. 8 the definite state of carcinoma is reached; some of the epithelial cells described in the preceding paragraph (2) have escaped into the surrounding tissues.

Some highly malignant tumours—of the thyroid gland, for example—may appear morphologically to be normal and give rise to normal secretions. Tumours of this class would still be dysgenetic in type because, however normal they look, they are pathological in growth and behaviour, and form metastases.

4. A pure adenoma may occasionally arise in the breast: it usually does so at the age of puberty and grows with great rapidity. Sometimes the patient is considerably older. It is a benign tumour.

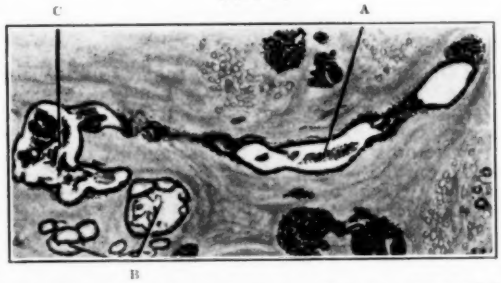
Pathological Changes in Connective Tissues.

A report on the condition of the epithelium would not be complete unless it contained a description of its relation to the connective tissues of the gland.

A. *The State of the Intra-Elastica Connective Tissue.*

This tissue exists immediately beneath the surface epithelium of ducts and acini, and consists of a single layer of unstriated muscle fibre on which the epithelial

Fig. 6.



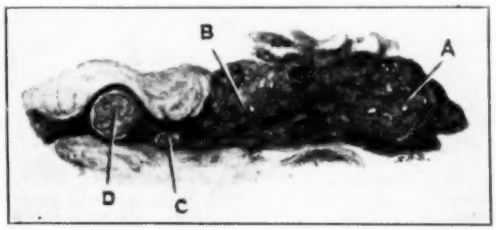
The figure has been drawn from a section of a terminal duct A and C leading into its acini B. The portion of the duct A and the acini B are in an active state of the cystophorous hyperplasia type 2. The portion of the terminal duct C is being distended by a dysgenetic epithelial hyperplasia which has undergone a papillomatous formation which is strictly limited within the normal boundaries of the duct. There was carcinoma elsewhere in this breast, for which it was removed.

cells lie, and loose connective tissue composed of scattered branching cells among a delicate fibrillous matrix. The intra-elastica tissue becomes most obvious when it undergoes hyperplasia, which it may do in terminal ducts and acini. It is usually quite localised in situation and never occupies large areas of the gland. Its condition and situation in a duct can be defined only when the elastica is especially stained. It is important pathologically because it gives origin to localised tumours which may grow and bulge into the ducts, forming small papillomatous growths; or it may be the site of origin of large fibro-adenomata (intracanalicular). When it exists in the presence of carcinoma it is the first tissue to be invaded by epithelial cells, before they reach the elastica. Hyperplasia of this connective tissue is often present in more or less degree when there are other pathological activities in the same breast, for which search should be made, and in this respect it resembles hyperplasia elastica.

B. *The State of the Elastica.*

Normally the elastica consists of a narrow, well-defined layer of elastic fibres outside the intra-elastica connective tissue of ducts. It is directly continuous with the subepithelial elastica of the nipple, areola,

Fig. 9.



A whole section (natural size) of a segment of a breast. The segment was removed because the fibro-adenoma D was discovered clinically. Microscopical examination revealed two important and common events. There is another fibro-adenoma C, and at B the breast has undergone a diffuse hyperplasia of the pericanalicular and periacinous connective tissue. The fibro-adenomata D and C were also composed of a much more localised hyperplasia of the same connective tissue. The age of the girl was 15½ years. The rest of the breast (A) shows marked regular hyperplasia of the pericanalicular and periacinous tissue amongst which lymphocytes are present. There is also a regular and extensive genetic new formation of acini.

and skin. It may occasionally surround some acini by a single narrow defined line, and it may here and there surround a lobule. It becomes pathological when it undergoes hyperplasia, which it may do to an enormous degree and be represented by more than 100 per cent. of its normal amount (see Fig. 8). In a state of hyperplasia it commonly surrounds acini as well as ducts, so that it must be assumed that the connective tissue forming part of the wall of the acini possesses the potentiality of forming elastica.

Hyperplasia elastica may affect the ducts and acini of the whole gland or it may be quite localised to a few ducts only. Hyperplasia elastica may occasionally exist alone, but usually it accompanies other forms of pathological hyperplastic activity, which should always be searched for when hyperplasia elastica is present. For instance, the elastica can be demonstrated to have undergone enormous hyperplasia round some terminal ducts and acini which contain the malignant epithelial hyperplasias from which the invading epithelial cells have escaped to establish the presence of carcinoma (see Fig. 8). Often the elastica may be absent—it is so at birth—and even later in life none can be detected in some glands even when the elastica of their blood-vessels stains normally.

Too often isolated deposits of carcinoma are described as being multiple foci of multicentric origin. If a deposit shows only the carcinoma cells in tissues where epithelial cells ought not to be, then that focus must be definitely described as a secondary deposit only. If, on the other hand, a terminal duct and its acini (Fig. 8) can be demonstrated full of epithelial cells identical in appearance with those invading outside structures, then it can definitely be described as a primary focus of carcinoma. In order to be quite sure that the tube is a duct and not a distended lymphatic vessel the elastica of the duct must be stained.

C. *The State of the Pericanalicular and Periacinous Connective Tissue.*

When discussing genetic epithelial hyperplasia I definitely stated that this particular connective tissue undergoes hyperplasia in states of normal activity and nearly disappears when the gland is at rest. It is an intimate component part of the true breast structures and it should be so regarded. The pericanalicular and periacinous connective tissue

usually becomes pathological by undergoing an excessive localised or diffused hyperplasia when it is normally active in the rest of the breast.

For example, the fibro-adenomata of puberty is composed of an excess of the pericanalicular and periacinous connective tissue which is being normally active elsewhere (Fig. 9). In fact a fibro-adenoma or fibro-adenomata (they are often multiple, see Fig. 9) of puberty may be regarded as being a more or less localised excess of the physiological activity that is present in the rest of the gland. This physiological likeness is increased when a fibro-adenoma of puberty contains newly formed acini which are also appearing in the rest of the breast at the same time. Again, appearances which are normal at birth, puberty, and in pregnancy and lactation become pathological when they are present at a time when the breast should be at rest—for example, in mazoplasia.

CONCLUSIONS.

A pathological report upon the state of epithelial hyperplasia should allude specifically to these epithelial states, and should state whether the hyperplasia be genetic, desquamative, or dysgenetic. If it be *genetic* the process is normal and should not give rise to any anxiety on the part of the clinician. If the epithelial hyperplasia be desquamative it is important to state whether it belongs to type (a) *mazoplasia*, or type (b), *cystophorous hyperplasia*. If it belongs to type (a), *mazoplasia*, there need be no anxiety about the future, except as regards the possible formation of fibro-adenomata. It is improbable that the condition would be complicated by the formations of papillomata or carcinoma. On the other hand, if it belongs to type (b), the *cyst-forming* type, the clinician will at once have the following grounds for anxiety: 1. There is almost the certainty of constant trouble arising from the appearances of fresh cysts. 2. A cyst may contain an epithelial hyperplasia which is no longer desquamative, but has become dysgenetic in type; therefore, however small the lesion may be, it is an epithelial tumour (see Figs. 5, 6, 7). The tumour may be papillomatous in type, sessile in type, or sessile and malignant in type, yet all these types may be contained within normal boundaries. No notion can be made as to how long they may thus continue. The papillomatous states are known to last a long time. For all I know the sessile benign-looking state and the sessile malignant-looking state may sometimes disappear entirely. On the other hand, if either of them progress, carcinoma is the inevitable result. Finally, if the epithelial hyperplasia is *dysgenetic* in type, the pathologist should state whether it is papillomatous and confined within normal boundaries, or whether it has transgressed them to become a duct carcinoma. Is it sessile and benign-looking and confined within normal boundaries? Or is it malignant-looking, but still confined within normal boundaries? Or is it a carcinoma? When pain is generalised over both breasts and no lump or local nodularity can be discovered, the gland belongs to the mazoplasia group and calls for no further treatment than support, attention to the psychic condition of the patient, correction of pelvic ailments, and the application of X rays or radium; the gland may be excised if the pain becomes unbearable. As to dysgenetic epithelial hyperplasia of the breast, its future treatment—so far as present knowledge is concerned—seems to depend upon how far the efficiency of radium can be trusted. It is possible that all forms of this type may be annihilated by the efficient application of radium. Until that time arises it is by far the safest course to remove by radical operation all breasts that are cystic and all breasts that contain dysgenetic epithelial hyperplasia. In the case from which Fig. 5 was drawn sufficient would have been done if all the ramifications and acini of the whole of the involved duct had been excised—a perfectly impossible operation. The same treatment would not have been indicated in the case from which Fig. 7 was drawn; unsuspected carcinoma was discovered upon microscopic examination of whole sections of the gland.

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Special Articles.

MILK CONSUMPTION AND THE GROWTH OF SCHOOL-CHILDREN.

SECOND PRELIMINARY REPORT ON TESTS TO THE SCOTTISH BOARD OF HEALTH.

BY GERALD LEIGHTON, O.B.E., M.D., F.R.S. EDIN., HON. D.SC. SYRACUSE,
MEDICAL OFFICER (FOODS) TO THE BOARD;
AND
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THE preliminary report by Dr. J. B. ORR on the result of the 1926–27 investigation into the feeding of a large number of school-children has already been published in THE LANCET (1928, i., 202). The conclusions which might be drawn from that work appeared to the committee in charge of the test to be so interesting and important that it was decided to continue the investigation over a further period of equal length.* That has been done and the present report deals with this period of the repeated test—namely, November, 1927, to June, 1928.

The seven centres at which the investigation was carried out were Peterhead, Aberdeen, Dundee, Edinburgh, Glasgow, Greenock, and Belfast. The number of children involved was 1425. At each place four groups of children were selected and each group treated differently. One group received whole milk, another separated milk, a third a biscuit ration of the caloric value of the separated milk, while a fourth acted as controls, receiving nothing.

The children of 13–14 years received	1	pint of milk daily.		
,,	9–10	,,	1	,,
,,	6–7	,,	½	,,

All the milk was given at the schools under supervision. The whole milk was pasteurised, except at Peterhead and Aberdeen, where it was "Certified." The separated milk was machine-skimmed. Samples of all the milk given were taken monthly and sent to the Rowett Research Institute, where they were analysed. These analyses show that the average fat percentage of the whole milk was 3·85 and that of the separated milk 0·33.

Measurements.

The measurements were all done by one of us (M. L. C.) and were done four times everywhere except at Belfast, where they were done three times. As in the 1927 test the children were all weighed and measured in indoor garments and without shoes. This year the heights were recorded to the nearest eighth of an inch and the weights to the nearest quarter of a pound. To obtain a fairly accurate *average* increase in weight a careful record was made at each weighing of every article of clothing worn by the child, and from these records the average weight of clothing for boy or girl was calculated. The difference between the initial (winter) and final (summer) weight of clothing was then added to the final gross weight. In Belfast in three schools the children were weighed in one garment only, and the difference between winter and summer weights was therefore the exact increase made by the child.

To obviate fluctuations, as far as possible, the weights and heights were taken at the same hour of the day

* Owing to the death of Dr. Lewis Cruickshank and to the absence of Dr. J. B. Orr abroad, it was decided to place the organisation of the second investigation in the hands of Dr. Gerald Leighton. This also enabled the Board's wide knowledge of the nutrition of school-children and the implications of such in connexion with public health to be more readily utilised.

on each occasion, this being in the case of children receiving milk before the milk was drunk. As far as possible the schools were visited in the same rotation in order that the period between initial and final weights and heights might be identical. On each visit an accurate record was obtained for each child of all absences and illnesses. Thus the exact amount of supplementary feeding was known. Any child who had missed 25 per cent. of feeds, or showed other abnormality, was excluded when calculating the results. The number so excluded was 268.

Special Conditions of the Investigation.

In considering the results of this investigation the following points should be borne in mind. The number of children involved was very large, no less than 1157 being available for the measurements from which the tables are compiled. These children were divided among seven centres of population in which the test was conducted simultaneously. Their ages ranged from 5 years to 13 years, including the beginning, the middle, and the end of their ordinary school life. All the children in the six Scottish centres were living in the ordinary conditions of Scottish working-class homes, and received the ordinary diet of such homes. The milk and biscuit given to them at the schools were therefore in the nature of a *supplementary ration to their home food.* The results therefore must be regarded as the effect of the addition of definite quantities of milk to the average home diet of children of school age living in ordinary working-class conditions in industrial centres. It would appear to be justifiable to infer that the same results, whatever they may be, would apply to the whole school population living their ordinary life. Those conditions, from the standpoint of a nutritional investigation, are, of course, very complicated, but this test was so devised as to bring out any *significant* differences which might arise within the limits laid down.

The following three tables show the total results of the investigation.

TABLE I.—*1928 Increases. Milk* versus *Non-Milk Groups and Percentages.*

—	No.	Height increase.	Weight increase.
13-year groups—			
Milk	137	1·4699 in.	5·6387 lb.
Non-milk ..	133	1·1908 in.	4·2368 lb.
		= +0·2791 in. —i.e., 23·44 %.	= +1·4019 lb. —i.e., 33·09 %.
9-year groups—			
Milk	188	1·3943 in.	3·4202 lb.
Non-milk ..	212	1·1068 in.	2·0495 lb.
		= +0·2875 in. —i.e., 25·98 %.	= +1·3707 lb. —i.e., 66·88 %.
6-year groups—			
Milk	242	1·5021 in.	2·5331 lb.
Non-milk ..	245	1·2398 in.	1·8531 lb.
		= +0·2623 in. —i.e., 21·16 %.	= +0·6800 lb. —i.e., 36·70 %.
All age-groups—			
Milk	567	1·4585 in.	3·5776 lb.
Non-milk ..	590	1·1810 in.	2·4610 lb.
		= +0·2775 in. —i.e., 23·50 %.	= +1·1166 lb. —i.e., 45·37 %.
1927 Increases (Scotland—all ages)—			
Milk	551	1·470 in.	3·617 lb.
Non-milk ..	731	1·212 in.	2·974 lb.
		= +0·258 in. —i.e., 21·29 %.	= +0·643 lb. —i.e., 21·62 %.

From Table I. it is seen that taking all the ages combined of the 1157 children and dividing them into milk-fed groups and non-milk-fed groups, there is an average increase in height of 23·5 per cent. and in weight of 45·37 per cent. in favour of the milk-fed groups over the non-milk-fed groups. It is also seen that these increases are greater in this second and repeated test than they were in the first (1927) test.

Table II. shows the increase in height and weight in all the age-groups with the number of children in each group. In every case the milk-fed children are

TABLE II.—*1928 Increases in Age-Groups.*

—	No. of children.	Height increase.	Weight increase.
		in.	lb.
13-year groups—			
Whole milk	68	1·4540	5·5662
Separated milk	69 (270)	1·4855	5·7101
Biscuits	67	1·1194	4·4179
Controls	66	1·2633	4·0530
9-year groups—			
Whole milk	105	1·4238	3·5333
Separated milk ..	83 (400)	1.3569	3·2771
Biscuits	101	1·1077	2·0396
Controls	111	1·1059	2·0586
6-year groups—			
Whole milk	121	1·5589	2·7107
Separated milk ..	121 (487)	1·4452	2·3554
Biscuits	115	1·2424	2·1609
Controls	130	1·2375	1·5808
Total number.. ..	1157	—	—

ahead of the "biscuit" and "control" groups. The greatest increase in height is in the 6 year old milk-fed group. The greatest increase in weight is in the 13 year old separated milk group. The difference between the "biscuit" group and the "controls" is but slight except that the 13 year old "controls" did better in height but not so well in weight. In the 6 year old group the "biscuit" group is better in weight than the "controls."

In Table III. there is set forth the mean increase in pounds and inches (i.e., for weight and height) in each group at each age, together with the probable error involved and the significance or otherwise of the differences.

Other Observations.

In addition to the foregoing statistical observations two other lines were adopted which do not permit of being stated in figures.

Dr. C. A. Douglas examined all the children clinically when they were measured. Her report states that—

> "In practically every case it was noted that the children receiving milk showed, even where there was obviously poor maternal care, that sleekness peculiar to a well-nourished animal. Their hair had a glossy and bright appearance. Their nails were smooth, resilient, and looked as if polished. General alertness was common to all the children fed on milk. No difference could be detected with regard to these points between the children receiving milk irrespective of the kind of milk. It was gathered from teachers and janitors that the children receiving milk were much more alert and very much more boisterous and difficult to control than the others. This latter fact was only too evident when they were waiting in small groups to be weighed."

Dr. G. W. Simpson made a different observation. He asked the headmasters to parade the children in their respective groups, he himself being unaware which group was milk-fed or otherwise. From this general survey he placed the groups in order of apparent standard of nutrition. Of five examinations thus made he found that first places of nutritional standard were accorded to three whole-milk and two separated milk groups. Second places were accorded to two whole-milk and three separated milk groups. Third places were accorded to all five biscuit groups, and fourth places to all five control groups.

> "The difference in nutrition between groups receiving milk and not receiving milk was plainly evident. No great difference was noticed between the whole milk and separated milk groups."

TABLE III.—1928 NUTRITION TEST.

Those familiar with the manner in which statistics of this kind are worked out will be aware that, in order that the difference between two groups and figures may be regarded as "significant," that difference must be at least three times as great as the "probable error." The results in this table are calculated on that basis.

A. *13 years. Weights (Increases in lbs.).*

—			Increase. I.	Increase. II.	Difference.	Probable error.	Result.
Whole milk	(68)	v. Separated milk (69) ..	5·5662	5·7101	−0·1439	0·2979	− 0·483 Insignificant.
		v. Biscuits (67) ..	5·5662	4·4179	+1·1483	0·3080	+ 3·728 Significant; better.
		v. Controls (66) ..	5·5662	4·0530	+1·5132	0·2816	+ 5·374 ,, ,,
Separated milk	(69)	v. Biscuits (67) ..	5·7101	4·4179	+1·2922	0·3400	+ 3·801 ,, ,,
		v. Controls (66) ..	5·7101	4·0530	+1·6571	0·3163	+ 5·239 ,, ,,
Biscuits	(67)	v. Controls (66) ..	4·4179	4·0530	+0·3649	0·3258	+ 1·120 Insignificant.
B. *Heights (Increases in Inches).*							
Whole milk	(68)	v. Separated milk (69) ..	1·4540	1·4855	−0·0315	0·0424	− 0·743 Insignificant.
		v. Biscuits (67) ..	1·4540	1·1194	+0·3346	0·0431	+ 7·763 Significant; better.
		v. Controls (66) ..	1·4540	1·2633	+0·1907	0·444	+ 4·295 ,, ,,
Separated milk	(69)	v. Biscuits (67) ..	1·4855	1·1194	+0·3661	0·453	+ 8·081 ,, ,,
		v. Controls (66) ..	1·4855	1·2633	+0·2222	0·0466	+ 4·768 ,, ,,
Biscuits	(67)	v. Controls (66) ..	1·1194	1·2633	−0·1439	0·472	− 3·049 Significant; worse.
C. *9 Years. Weights (Increases in lbs.).*							
Whole milk	(105)	v. Separated milk (83) ..	3·5333	3·2771	+0·2562	0·1468	+ 1·745 Insignificant.
		v. Biscuits (101) ..	3·5333	2·0396	+1·4937	0·1344	+11·114 Significant; better.
		v. Controls (111) ..	3·5333	2·0586	+1·4747	0·1360	+10·843 ,, ,,
Separated milk	(83)	v. Biscuits (101) ..	3·2771	2·0396	+1·2375	0·1403	+ 8·820 ,, ,,
		v. Controls (111) ..	3·2771	2·0586	+1·2185	0·1419	+ 8·587 ,, ,,
Biscuits	(101)	v. Controls (111) ..	2·0396	2·0586	−0·0190	0·1290	− 0·147 Insignificant.
D. *Heights (Increases in Inches)*							
Whole milk	(105)	v. Separated milk (83) ..	1·4238	1·3569	+0·0669	0·0261	+ 2·563 Not quite significant.
		v. Biscuits (101) ..	1·4238	1·1077	+0·3161	0·0281	+11·249 Significant; better.
		v. Controls (111) ..	1·4238	1·1059	+0·3179	0·0263	+12·087 ,, ,,
Separated milk	(83)	v. Biscuits (101) ..	1·3569	1·1077	+0·2492	0·0237	+10·515 ,, ,,
		v. Controls (111) ..	1·3569	1·1059	+0·2510	0·0215	+11·674 ,, ,,
Biscuits	(101)	v. Controls (111) ..	1·1077	1·1059	+0·0018	0·0239	+ 0·075 Insignificant.
E. *6 years. Weights (Increases in lbs.).*							
Whole milk	(121)	v. Separated milk (121) ..	2·7107	2·3554	+0·3553	0·1112	+ 3·195 Significant; better.
		v. Biscuits (115) ..	2·7107	2·1609	+0·5498	0·1020	+ 5·390 ,, ,,
		v. Controls (130) ..	2·7107	1·5808	+1·1299	0·1031	+10·959 ,, ,,
Separated milk	(121)	v. Biscuits (115) ..	2·3554	2·1609	+0·1945	0·1055	+ 1·844 Insignificant.
		v. Controls (130) ..	2·3554	1·5808	+0·7746	0·1066	+ 7·266 Significant; better.
Biscuits	(115)	v. Controls (130 ..	2·1609	1·5808	+0·5801	0·0969	+ 5·987 ,, ,,
F. *Heights (Increases in Inches).*							
Whole milk	(121)	v. Separated milk (121) ..	1·5589	1·4452	+0·1137	0·0250	+ 4·548 Significant; better.
		v. Biscuits (115) ..	1·5589	1·2424	+0·3165	0·0243	+13·025 ,, ,,
		v. Controls (130) ..	1·5589	1·2375	+0·3214	0·0250	+12·856 ,, ,,
Separated milk	(121)	v. Biscuits (115) ..	1·4452	1·2424	+0·2028	0·0221	+ 9·176 ,, ,,
		v. Controls (130) ..	1·4452	1·2375	+0·2077	0·0228	+ 9·110 ,, ,,
Biscuits	(115)	v. Controls (130) ..	1·2424	1·2375	+0·0049	0·0221	+ 0·222 Insignificant.

A sixth examination did not correspond with the other five, but in this case the best nourished children had been selected as "controls," while those apparently needing the milk most were put into the milk groups. The desired conditions for observation were thus not fulfilled.

TABLE IV.—*Groups Reversed.*

—	Average increase in— Height (inches). 1927	Height (inches). 1928	Weight (lbs.). 1927	Weight (lbs.). 1928
GLASGOW. *5 year old children.*				
Separated milk 1927, biscuits 1928	1·500	1·351	2·407	2·212
Biscuits 1927, separated milk 1928	1·101	1·454	2·234	2·237
8 year old children.				
Separated milk 1927, biscuits 1928	1·297	1·213	3·471	2·063
Biscuits 1927, separated milk 1928	1·089	1·336	2·266	3·207
GREENOCK. *5 year old children.*				
Whole milk 1927, controls 1928	1·543	1·163	1·994	1·875
Controls 1927, whole milk 1928	1·470	1·479	1·595	2·639

A Test Reversed.

One very interesting result came out in this repeated investigation. In order to ascertain what

TABLE IVA.—*Groups Continued.*

—	Average increase in— Height (inches). 1927	Height (inches). 1928	Weight (lbs.). 1927	Weight (lbs.). 1928
PETERHEAD. *5 year old children.*				
Whole milk	1·550	1·384	2·741	2·569
Separated milk	1·568	1·356	2·983	2·576
Biscuits	1·392	1·270	1·973	2·188
Controls	1·425	1·311	1·773	2·048
DUNDEE. *8 year old children.*				
Whole milk	1·105	1·197	2·556	3·205
Separated milk	1·209	1·347	2·659	3·000
Biscuits	0·931	1·054	2·404	2·738
Controls	0·972	1·156	2·433	1·911
EDINBURGH. *8 year old children.*				
Whole milk	1·483	1·429	3·330	4·057
Separated milk	1·457	1·383	3·238	3·531
Biscuits	1·286	1·031	2·972	1·650
Controls	1·224	1·100	2·132	2·438
GREENOCK. *5 year old children.*				
Separated milk	1·625	1·443	1·969	2·243
Biscuits	1·455	1·131	1·200	2·050

would occur two of the previous feeding groups were reversed. A group which in the first investigation received separated milk now received biscuit. Another group which in the first investigation were "controls" now received whole milk. The general result in both cases was that they changed places, the former milk group now receiving biscuit fell to the biscuit standard, while the former "control" group now receiving milk rose to the milk standard. Table IV. shows the detailed results of this reversed test. Table IVA. shows similar details for the other areas (groups continued not reversed).

Conclusions.

As the result of this repeated investigation (1927–28) it may be said at once that the tentative conclusions drawn by Dr. J. B. Orr from the first investigation were more than justified. The great value of an additional milk ration to that already taken at home is clearly demonstrated for all ages of school-children.

In the repeated test the average increase in height in the milk-fed groups in all ages combined is actually *1·21 per cent. more than in the first test.* The average increase in weight in the milk-fed groups in all ages combined is no less than *3·75 per cent. more than in the first test.* Not only have the same milk-fed children benefited again, but they have done so to a greater extent than before. Their initial improvement has *continued over the second year.*

Once more the value of separated milk for children of school age is shown. In most groups the difference in height and weight between the whole milk and separated milk groups is not "significant," but in the 6 year old group whole milk is "significantly" better than separated for both weight and height. In every case the whole milk and separated milk groups are better than the "biscuit" or the "controls." In this repeated test the difference between the "biscuit" and the "controls" is usually "insignificant"; the effect of the extra biscuit appears almost negligible. The improvement of the milk-fed groups in general health and appearance is clearly brought out in the reports of Dr. C. A. Douglas and Dr. G. W. Simpson. Many of the teachers have recorded similar opinions.

When these results are considered, along with those published by Dr. Corry Mann in this country and those of observers in other countries, the only conclusion possible is that they have a wide public health significance, especially with the nutrition of school-children.

"In 1903, when the Royal Commission on Physical Training (Scotland) issued their report, two things became clear: first, that medical examination and superintendence were essential conditions of any system of physical education; second, that in the end *the fundamental problem is one of nutrition.* . . . When every preventable ailment is prevented, and every serious disease treated to its finish, the new battalions of children coming forward have to be superintended from the nutritional standpoint."—Sir Leslie Mackenzie.

The two reports of this investigation fully substantiate these views.

Committee of Investigation.

The investigation was conducted under the direction of a Committee appointed by the Scottish Board of Health with Sir Leslie Mackenzie as chairman. The members consisted of the school medical officers for the cities and towns where the work was carried out.

We desire to thank Dr. J. F. Tocher, Aberdeen, and Mr. J. S. Thomson, Rowett Research Institute, for advice and help on the statistical side of this investigation. The results of the investigation have also been submitted from time to time to Prof. A. P. Cathcart, chairman, Nutrition Committee of the Medical Research Council.

The cost of the investigation was defrayed by a grant made by the Empire Marketing Board to the Rowett Research Institute, Aberdeen.

MEDICINE AND THE LAW.

Failure to Provide Medical Treatment for Child.—Rebutting Medical Evidence Called by Defendant.

THE parent who has been prosecuted before the Wolverhampton magistrates for neglecting his child in a manner likely to cause unnecessary suffering, in that he refused to sanction an operation for the removal of the child's tonsils,[1] made his final appearance before the bench on Dec. 16th. The Distributist League, of which Mr. G. K. Chesterton is president, had undertaken his further defence. Counsel, instructed by Birmingham solicitors acting for the League, said he desired to make it clear that, if an operation was considered to be the only possible remedy, nobody suggested that the operation should not be performed. The child had now been examined by four London consultants, two of whom were tendered as witnesses, while statutory declarations had been obtained from the other two. Dr. Fergie Wood stated that the little girl's tonsils were very much enlarged, but that he could not find any evidence of her health having suffered. He did not recommend an operation, but suggested a treatment. Dr. Bertrand Allinson said he found the tonsils enlarged and a slight deafness in the left ear. He, too, recommended treatment—a strict diet and breathing exercises; he said he would resort to surgical operation only as the very last remedy. Counsel for the defendant submitted that the parent, so long as he followed the advice of responsible doctors, could not be said to be failing to provide adequate medical aid for his child. The father, in the witness-box, expressed his willingness to allow the child to be examined monthly by a school doctor, and it was agreed that copies of the doctors' reports should be given him.

It may be recalled that the Wolverhampton bench, at the original hearing of this charge, was satisfied that the prosecution had made out its case, but that sentence was postponed for a month with the idea of seeing what action the defendant would take in the interval. The Deputy Town Clerk, appearing for the Wolverhampton Education Committee, explained that the Committee had not insisted on an operation, and that, if there were any other treatment which would effect a cure, such treatment would be regarded as adequate. The magistrates fined the father 40s. and dismissed the charge against the mother. They took the view that the father had failed to procure adequate medical aid for the child, although he had now agreed to adopt treatment to prevent the suffering caused to the child in the past. As was suggested in these notes recently, the evidence (above described) which was tendered to show that an operation was unnecessary might appropriately have been offered by way of defence to the charge, rather than as an afterthought in mitigation of sentence. The benevolent intervention of the Distributist League, whose mysterious title presumably conceals a policy of advocating individual liberty against State interference, has provided the material for defendants in future proceedings under Section 12 of the Children Act in enlarged tonsils and adenoids cases. It has to be borne in mind that, while the prosecution is presumably obliged to specify the medical or surgical treatment which the accused person is alleged to have neglected to provide, the magistrates have no power to order an operation; all they can do is to put pressure upon a defendant by suspending sentence with the hint that no punishment will be imposed if the medical advice is followed.

X Ray Apparatus Accident.

An unfortunate accident at the Royal Infirmary at Hull was investigated by the Hull coroner on Dec. 18th. A girl, 8 years of age, had fallen on the ice and broken her arm, and was taken to the Infirmary for X ray examination. During the third examination a

[1] THE LANCET, Nov. 24th, 1928, p. 1081.

nurse moved to another part of the room, and by so doing completed an electric circuit, with the effect that the child was killed, the child's mother (who was holding the child's hand) received a severe shock and the nurse also was injured. Dr. C. R. Moore, who was in charge of the X ray apparatus, said he gave the usual warning to those in the room not to touch the wires. Dr. J. E. Bannen, hon. radiologist to the Infirmary, explained at the inquest that, by going to the dangerous side of the table while the high-tension circuit was in operation, the nurse unwittingly placed herself in an ideal position—even if she did not actually touch the wires, but merely went near them—to form a complete electric circuit sufficient even at a low voltage to kill the child. There was no efficient method, he added, for insulating the leads. The jury returned a verdict of "accidental death." The coroner stated that there was no question of any culpability on the nurse's part; she had given her evidence with commendable candour. The admission to the X ray room of inexperienced persons was, he remarked, a question to be considered by the infirmary authorities.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Transmission of Malaria by a Transfusion of Blood.

AN unusual occurrence was disclosed recently during a discussion at a medical society in this city. The facts were as follows. A middle-aged woman, brought to a gynæcological clinic in Vienna, had to be operated on at once on account of an extra-uterine pregnancy. Both before and during the operation she lost a great deal of blood, so it was decided to perform a transfusion. From the list of donors who are at the disposal of the clinic, one was selected who was known to have acted in the same capacity three times before, and his blood was used in the ordinary way. The woman's condition picked up rapidly, but some time afterwards she developed high fever, and was transferred to a medical clinic, where the diagnosis of tertian malaria was made and confirmed. As she had never before suffered from malaria, the donor was at once suspected and was submitted to an examination, which showed the presence of plasmodia in his blood. He contended that he had never suffered from malaria—indeed, that he had never had any fever at all, and had not been outside Vienna. It was possible to trace the three other patients to whom he had acted as donor, and these also proved to have been infected. They had suffered from time to time from attacks of fever, but the right diagnosis was not made until they were summoned to the clinic for investigation. This incident shows the need for an exhaustive examination of donors, not taking too much account of a negative previous history.

The Health of Vienna.

The Federal Board of Health of Austria has published a report on certain factors which influence public health and the fluctuations of the population. During 1927 the population of Vienna was estimated at 1,866,147, and the deaths at 26,379. The number of marriages was 16,256, and the decrease of population (excess of deaths over births) was 5042—that is to say, twice what it was a year ago. No case of cholera, small-pox, typhus, or epidemic meningitis was reported, but 880 persons died from suicide, 43 were murdered, and there were 658 fatal accidents. The number of medical practitioners in the city was 4519, or 468 more than in 1924 (an increase of 11·5 per cent.), and 110 more than in 1926 (an increase of 2·8 per cent.). For the whole of Austria the increase was 872—i.e., 12·2 per cent. over the figure for 1924, or 4 per cent. over that for 1926. The mortality in Vienna was 14 per 1000 in the population as a whole, but for the medical profession the rate was only 9·8. A marked increase in the mortality figures was caused by the rapid spread of diphtheria and measles last year, especially amongst school-children. Whereas in 1926 only 99 persons succumbed to diphtheria, last year the figure rose to 198, and against 9 deaths from measles in 1926 there were 133 in 1927. Therefore the Board of Health is urged to reconsider its previous order which abolished the necessity of notifying measles to the district officer of health, and is recommended to introduce one of the numerous methods of prophylaxis against this disease.

Diseases of Over-feeding.

Dr. Kollert discussed recently in the Medical College for Post-graduates the problem of conditions produced by excess of food. He said that in eclamptic uræmia fat is excreted in the urine, and œdema is very often noticeable. During the later part of the war, when there was a scarcity of fat in the daily fare, fat in the urine, as well as uræmia eclamptica, was almost unknown here, although there were numerous cases of nephritis. With reappearance of fat in the daily food the old conditions returned. Cirrhosis of the liver was also very rare during that period, whilst diabetic troubles and Graves's disease became much less common. Observations amongst primitive races seem to prove that an almost exclusive meat diet predisposes to early arterio-sclerosis. Over-feeding with vitamin B, he believes, distinctly encourages enlargement of the spleen and lymph glands—the "lymphatic habitus" of the older writers, who already suspected faulty feeding as a causal factor in this condition. Excess of vitamin D, he said, seems to promote calcification of the large blood-vessels. But all these relations are not yet thoroughly investigated, and only one fact stands out clearly—namely, that diseases run a different course according to the kind of feeding which the patient had before his illness.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

The National Insurance Bill.

AFTER many years of contemplation a Bill providing for national insurance has been introduced to the Commonwealth Parliament. In 1923 a Royal Commission investigated the problem but the present proposals are only approximately based on the recommendations of that Commission. Financial provision is made against sickness, disablement, widowhood, orphanhood, and superannuation. Medical benefit is not included. Workers who have a total income exceeding £416 will not come under the terms of the Bill. Sickness allowance of £1 7*s.* 6*d.* per week is payable to male adults, £1 per week to female adults, and 15*s.* per week to minors unless married. After 26 weeks the maximal allowance is reduced to £1 per week. In the event of death the widow would receive £1 per week for at least three years, and 5*s.* for each child under the age of 16 years. A superannuation allowance of £1 per week is payable at the age of 65 for males and 60 for females. The contributions that will entitle the insured person to these benefits will be 1*s.* per week, plus a further 1*s.* contributed by the employer. Women will each contribute 6*d.* It is stated that the proposed scheme "will follow the general lines of the British National Insurance," but this does not satisfy the commercial section of the community, who fear that it will be an added burden to industry. Employers have a vivid recollection of a child endowment scheme in New South Wales which was designed to benefit the married men by increasing their wages in proportion to the size of their family, but actually forced the married men out of employment and increased the cost of living.

Throughout Australia there is evidence that voluntary contributions for hospital maintenance

are falling away, so that increased claims are being made on public funds. The grants per bed to hospitals, from the funds of the respective State Governments at the present time, are: Victoria £45, Western Australia £83, New South Wales £99, Queensland £102, Tasmania £105, and South Australia £149. Victoria endeavours to increase the voluntary contributions to hospitals by means of a central fund known as the "Lord Mayor's Fund." During the financial year 1927–28 the total amount collected by this organisation amounted to £61,642. Queensland conducts a State lottery in the interests of the medical charities. For the financial year 1927–28 the disbursements from this source amounted to £335,610.

The function of the Victorian Bush Nursing Association is to provide trained and resourceful nurses who will undertake general nursing, obstetric, first-aid, and child welfare work. It was started in 1911 and there are now 59 bush nursing centres in Victoria. Considerable interest has been aroused by the records of the obstetric work of the Association.[1] For the past 12 months 792 cases were delivered without a single death. Antenatal supervision was given in 715 of these cases.

A Noise Abatement League has been founded in Melbourne. One reason for this is that the Melbourne Hospital is situated almost in the centre of the city, and the traffic noises in the surrounding streets are considerable. An intending benefactor of some importance has stated that he is not prepared to give a large donation to the hospital unless steps are taken to remove the tram lines from the contiguous streets. The Tramway Board has given the request serious consideration, but there are tremendous difficulties in the way. The situation has revived local controversy about the desirability of placing a general hospital in the centre of a city.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

A Source of Tropical Drugs.

INDIA has a source of great potential wealth in its home-grown drugs, an industry which only requires the attention of the people to develop on economic lines. The chemist and the pharmacologist can help in different ways. Many of the drugs used in Europe and America, for which some sort of standard has been laid down, grow in various parts of India. Chemical or biological assay of all these can be gradually made and their value relative to those growing in other parts of the world ascertained. It will be necessary not only to assay the plants growing wild in different parts of India, but also to find out their seasonal variation and the soils in which they grow best. Russian artemisia growing wild has been found to have a santonin content of less than 1 per cent., which is increased by cultivation to nearly 3·6 per cent. Russia accordingly at present is the best source of santonin, but artemisia grows wild in some parts of the Himalayas, in Baluchistan, and in the Hindu-Kush mountains. India could supply the whole world with santonin if only a little attention were given to its cultivation. Digitalis leaves or preparations used to be imported in large amounts into India. It has recently been shown that the drug deteriorates during transit or storage, and that to secure an active preparation it is desirable to get fresh leaves from Indian sources. Digitalis leaves of excellent quality are now being grown in different parts of India, and the Indian drug is gradually coming into wider use.

Again, *Ephedra vulgaris* grows wild in many parts of Northern India, and recent work on this indigenous plant has led to a demand for it outside India. America alone ordered 34 tons of ephedra during 1928. Taking the minimum yield of 0·5 per cent. of ephedrine, the alkaloid extracted from 34 tons would be worth (at current prices) nearly four lakhs of rupees. Should further knowledge lead to the wider use of ephedrine in medicine India will be a rich source of the drug. In numerous other instances a little initiative would give rise to increased export and increased cultivation. The extraction of some of these drugs in local factories would probably prove more economical than the export of the crude material. Thus the manufacture of caffeine from tea-dust or of strychnine from nux-vomica seeds are examples of substances whose manufacture in India has proved economical in spite of the high cost of solvents bought from abroad. But the demand for solvents would in turn lead to other industries for their manufacture.

The Mentality of Prisoners.

Lieut.-Colonel F. A. Barker, I.M.S., Inspector-General of Prisons in the Punjab, remarks that the study of the mentality of Indian prisoners provides an untouched field for research work. Discussing the value of psychology in dealing with the gaol population, in the quarterly *Bulletin* of the Indian Association for Mental Hygiene, Colonel Barker quotes the typical instance of a prisoner now confined in one of the Punjab gaols. During his prison career he has been punished over 300 times, and owing to the exasperation caused by his conduct in the minds of his guardians he has been transferred in turn from one gaol to another until he has visited most of the prisons of the province. The only gaol administration in this country which has attempted the study of mental defectives is that of the Madras Presidency where a special gaol has been set apart for such cases at Cuddalore. The convict population of this gaol at the end of last year numbered 335, of which a large proportion were either mental defectives or recovered lunatics. The superintendent is a medical officer specially trained in mental disorders and he pays individual attention to every case. Work and discipline are both light and the irksomeness of confinement is reduced to a minimum. Apart from the advantage to the mental defectives themselves, this segregation is beneficial to the other gaols, which are relieved of the handicaps to discipline and labour occasioned by the presence of this troublesome class.

New Bombay Hospital.

Sir Leslie Wilson, the Governor of Bombay, in laying the foundation-stone of the Sir Cowasji Jehangir Ophthalmic Hospital, paid a handsome tribute to the munificence of the Parsee community. The hospital fund associated with the founder's name has reached a total of 17½ lakhs of rupees. No other equally small community in any part of the world, said Sir Leslie, could show such a proud record, and the city owed an immense debt of gratitude to those early Parsee pioneers who laid the secure foundations of the city in trade, commerce, and communications with foreign countries, and whose successors ungrudgingly poured out their acquired wealth for its benefit.

Women Surgeons for Soldiers' Wives.

Under existing military regulations, wives and families of Indian soldiers are entitled to medical attendance at their quarters by the officer in medical charge of the unit to which the man belongs, or by a subassistant surgeon. As most of the wives of Indian soldiers observe the purdah, medical officers find it difficult to see them when they are sick. It has been decided, therefore, to appoint female sub-assistant surgeons as an experimental measure, and six are to be employed, in the first place, at the more important military centres in order to give the scheme a practical trial.

[1] See THE LANCET, 1927, ii., 1352.

EPSOM COLLEGE SANATORIUM.

SECOND LIST OF CONTRIBUTIONS.

A YEAR ago we published a description and plan of the new sanatorium which it is proposed to build to replace the present old-fashioned sick house and the temporary wooden isolation block. The plans drawn by the architects, Messrs. W. A. Pite, Son and Fairweather, showed a two-storey building, with accommodation for 50 boys, designed on the most modern system of hospital construction. The estimated cost of the sanatorium is £26,000, and as soon as £15,000 is in hand the Council of Epsom College will proceed to erect the buildings. The list of subscriptions published last year amounted to £4207 19s. 6d. Since that date the following subscriptions have been received, making a total of just over £5300.

	£	s.	d.
Adams, Dr. E. L.	25	0	0
Addison, Oswald	100	0	0
Baker, Dr. Thomas, O.B.E.	1	1	0
Baly, Dr. C. F. Peyton	3	3	0
Bell, Mrs. Theodore	1	1	0
Brixton and Streatham Medical Book Society	2	2	0
Brown, Dr. J. Percival	1	1	0
Bunbury, Dr. E. G.	1	1	0
Bush, Colonel J. Paul, C.M.G. (stock)	79	5	11
Cambridge Medical Society	5	0	0
Carden, Dr. William A.	10	10	0
Clayton, Dr. E. B.	2	2	0
Cunningham, Andrew	5	5	0
Drake, Dr. J. A. (second contribution)	1	1	0
Dunbar, Dr. Henry J., O.B.E.	5	5	0
Gotla, Dr. Framjee	1	1	0
Griffin, Dr. F. W. W.	2	2	0
Hampstead General Hospital, Hon. Medical Staff of	100	0	0
Handley, W. Sampson	10	10	0
Heald, Dr. C. B., C.B.E. (second donation)	5	5	0
Highton, H. C.	26	5	0
Jenkins, G. J., O.B.E., F.R.C.S.	5	5	0
Jessop Hospital, Sheffield, Medical Staff of	5	5	0
Kirkwood, Dr. William Douglas	1	1	0
Knight, Dr. R. H.	2	2	0
Morris, Dr. A. L.	1	1	0
Morris, Dr. Claude W., O.B.E.	5	5	0
Mugliston, Dr. T. C.	2	2	0
Neild, Dr. F. M.	2	0	0
Palmer, A. C., O.B.E.	5	5	0
Penrose, Dr. Frank G.	2	2	0
Pendlebury, H. S.	21	0	0
Richards, Dr. H. A.	1	1	0
Richardson, Mrs. S. M. V.	5	0	0
Roberts, Dr. Ffrangcon	5	5	0
St. Bartholomew's Hospital Medical Staff	200	0	0
Selby, Dr. Prideaux G., O.B.E.	10	10	0
Slater, Dr. Charles	5	0	0
Smith, Dr. F. W. W.	5	0	0
Surrey Branch of B.M.A. (further donations)	8	15	3
White, Sir William Hale, K.B.E., M.D.	20	0	0

Public Health Services.

CHANGES IN NATIONAL HEALTH INSURANCE LAW.

AMONG the changes in the law of health insurance which took effect at the beginning of the year are several of interest to the managers of hospitals. A new provision, substituted for Section 26 of the principal Act of 1924, authorises approved societies (subject to the consent of the Minister of Health) to subscribe or contribute to hospitals, dispensaries, and other charitable institutions or for the support of district nurses; such sums are to be treated as expenditure on benefits. Section 75 of the principal Act, dealing with schemes for the disposal of surpluses, is amended to allow the disposable surplus, up to such maximum amount as may be prescribed, to be applied in occasional donations to hospitals, dispensaries, charitable institutions, and district nursing funds and also "for the purposes of medical research to institutions approved by the Minister." Charitable institutions are significantly defined as any which the Minister is satisfied are ordinarily and to a substantial extent supported from sources other than public funds and payments out of funds of approved societies. Other new provisions arrange for continuing in insurance persons who cease to be employed (in place of the previous free year and prolongation arrangements), for deposit contributors, married women, and seamen. There are amendments, too, as to the management and accounts of approved societies and as to the inmates of hospitals. The 1928 Act mainly follows the Majority Report of the Royal Commission issued in February, 1926 (Cmd. 2596), but it ignores the Commission's recommendations for abolishing insurance committees and for partly pooling future surpluses of approved societies in order to finance an extension of insurance medical services. A new statutory list of "additional benefits," including dental and ophthalmic treatment, is substituted for the old list in the third schedule to the 1924 Act, and the Minister is empowered to make regulations governing the administration of schemes and of additional benefits and the arrangements for providing service or appliances towards the cost of which payment may be made by way of additional benefit. There is a modification of the conditions (contained in Section 24 of the 1924 Act) governing the administration of medical benefit. After a date to be prescribed, and except as authorised by regulations, persons (other than nurses or other hospital employees) will be restricted in respect of making their own arrangements for receiving medical treatment and attendance by way of participating in collective arrangements made through any system or institution. In this connexion it may be noted that the Minister of Health has just published new National Health Insurance (Medical Benefit) Consolidated Regulations, dated Nov. 26th, which revoke and replace the Consolidated Regulations of 1924 and seven subsequent sets of amending regulations.

This tidying process simplifying study of the regulations is in contrast to what has happened to the statutes. The Act of 1928, partly described above, sadly disturbs the neat text of the Consolidating Statute of 1924. Like the Unemployment Insurance Act of a year ago, the form of which roused Sir John Simon and Lord Carson to such vigorous protests in Parliament, the National Health Insurance Act of 1928 is an incomprehensible document in itself. The would-be student must take a copy of the principal statute and, with scissors and paste, snip out the dead matter and insert the new matter, much of which is inconspicuously presented in what the draftsman calls a Schedule of Minor Amendments. If, however, the statute book must be amended, this method of making direct alterations of specified passages is probably the simplest if the student is patient enough to work out the changes.

REPORTS OF MEDICAL OFFICERS OF HEALTH: A SURVEY OF 1927.

IN the course of last year we summarised something like a hundred annual reports of chief health officers for the year 1927, affording material for a hygienic survey of a considerable portion of the population of England, Wales, and Scotland. 1927, it may unthankfully be remembered, was a wet, cold, and sunless year.

General Sanitation.

Some progress was made in the *housing* problem, and most districts report that there is now accommodation available for the artisan and higher-paid worker, if he is willing to pay a higher rent. There is still little chance for the poorest workers and the big families. A few districts have done something in the matter of slum clearance. We are, in fact, just reaching the greatest difficulty of the problem—viz., the clearance of the slums and the provision of

houses for those who cannot pay the rentals which have to be charged for municipal houses.

There are many complaints as to the want of control of building. Houses may be erected where there are no drains and no roads for access. "Ribbon building" along the arterial roads is frequently inharmonious and destroys the beauty of the countryside. Suggestions have been made that new houses in the country should be built in clusters off the main roads.

In some districts renovation is carried out successfully in the default of the owners. In others the houses are too old and worn out for this treatment. Several medical officers favour Octavia Hill methods; others would like to see more effort to adapt municipal houses to the size of the family, so as to avoid subletting. One suggestion, to meet the wants of those most in need, is that some of the municipal houses should be let by the Health Committee with regard to the requirements and capacity to pay of the tenants, while the bulk are let on more or less business lines by the Housing Committee. From several districts come complaints as to the nuisance from tents, vans, sheds, and other makeshift houses.

The Housing (Rural Workers) Act, 1926, has been welcomed by many county medical officers, but the work done during the last half of 1927 was largely preliminary.

Scavenging.—New salvage schemes have in some cases caused adverse comments as to the handwork involved. In some districts there is also a difference of opinion between the medical officer and the surveyor as to the suitability of the maxim, "Burn your own refuse," seeing that house fires are not adapted for the purpose like the furnaces of a destructor.

Water-supply.—Many of the country districts are unsatisfactorily supplied, especially in the dairying counties. The need for some system of national pooling is obvious.

Smoke Prevention.—The new Act is being taken seriously, and has undoubtedly stirred up interest. Regional smoke advisory committees are in the air, and at least one executive committee has been formed—for Sheffield and Rotherham. More consideration is being given to smokeless fuel. Glasgow, Salford, and Halifax, amongst others, have paid special attention to this matter. In nearly 2000 of the Hull municipal houses the "Cookanheat" apparatus has been installed.

Rivers pollution is still in an unsatisfactory position. Notts reports great benefit from the appointment of a whole-time inspector, and that the trades are beginning to take a hand by instigating research. Ultimately no doubt this matter will be taken up by Boards for each river with all its tributaries. One can hardly expect the ratepayers of one county to go to great expense in purifying their rivers in order that the water may be fit for a neighbouring county to drink.

Milk.—The English counties have not, as a rule, instituted veterinary inspection of dairy cows but content themselves with following up tuberculous milk samples, often with very limited success in the discovery of the offending cows. There is no evidence of any lessening of bovine tuberculosis as judged by milk sampling or meat inspection. The Durham County Council have arranged for a scheme of inspection by whole-time veterinary surgeons. Clean milk competitions increase in number and do something to teach the employees, even the older ones, new and cleaner methods. Complaints of bottling milk in the street are quite common, and there is great need reported of a simpler nomenclature for graded milk. A noteworthy matter is the very varying percentage of tuberculous udders found in those towns where regular veterinary inspection of milk herds is in force.

Meat.—From the London meat markets comes an interesting report as to the discovery of bacilli of the avian type in tuberculous pig carcasses. Some 30 per cent. of the specimens examined by Dr. Stanley Griffith and Mr. R. L. Cornell, M.R.C.V.S., were found to be of the avian type, indicating that precautions should be taken to prevent pigs from feeding with infected fowls.

Infectious and other Diseases.

Diphtheria.—Immunisation is being generally adopted for hospital staffs and also for stemming outbreaks in schools and residential institutions. Edinburgh, several London boroughs, and Walsall are using it for the protection of the children generally. The city and county of Aberdeen immunise against both diphtheria and scarlet fever simultaneously on a considerable scale. The virulence test is being more generally adopted in order to set harmless carriers free from restrictions.

Scarlet fever is, as a rule, so mild as not to justify the expense of isolation in hospital, but in Bootle a great increase in severity was noted. Antitoxin for severe cases is becoming generally used, and in a few cases the hospital staffs are immunised.

Small-pox of the mild type has been prevalent in many districts. The few deaths attributed to it have mostly been those of persons suffering from other diseases.

Influenza was very prevalent in the first quarter of the year and swelled the death-rate from respiratory diseases in most districts. Glasgow was an exception and had less influenza than in 1926.

Poliomyelitis was less in evidence than in the previous year but caused a considerable outbreak in Hull with some evidence of case-to-case infection.

Encephalitis lethargica gave rise to fewer notifications but had a higher fatality-rate. Sometimes the deaths equalled or exceeded the notifications.

Rheumatism in Children.—Paddington and Kensington both inaugurated supervisory schemes with compulsory notification. Birmingham and the West Country are also taking up this subject with energy. Bristol has a scheme. Cardiff has been presented with a building, which is to be used as a rheumatism supervisory centre, while Plymouth has a "rheumatism register."

Tubercle.—The lateness of notification is a general complaint, and Salford and Newcastle are among the districts which cannot fill their sanatoriums with early cases. Belief in the efficacy of artificial pneumothorax in selected cases is growing.

Cancer.—Leicester has established a diagnosis clinic at the Royal Infirmary. Several local committees are active, and Manchester reports hopeful research as to the cause of "mule-spinners'" cancer.

Maternity and Child Welfare.

In several districts the newly trained midwives coöperate well in sending their cases to antenatal clinics. It is being more generally recognised that experienced obstetricians are required for the successful conduct of antenatal clinics. During the year Derbyshire made a new appointment of a whole-time woman doctor with special experience in obstetrics and gynæcology to conduct antenatal clinics, supervise and lecture to the midwives, &c. Several districts have followed the example of Hampshire in starting insurance schemes to secure the help of a doctor when needed by the midwife. A very general complaint in the reports is that the pay and status of the midwives are quite inadequate. One large Birmingham firm has arranged that "home helps" may be sent to the homes of their workpeople during the confinement or non-infectious illness of the mother, and has guaranteed the full fee in every case.

Hospitals.

There are many reports of the want of beds in general hospitals. Aberdeen has led the way by absorbing the poor-law hospitals. Many other towns have secured beds in the poor-law hospitals by coöperation with the guardians—e.g., Kensington, Glasgow, Sheffield, Leeds, Reading. The need for hospital treatment of pneumonia is being recognised on all hands. Many county medical officers complain

of the slow progress made in pooling the isolation hospital accommodation in these days when increased transport facilities make it desirable.

Artificial light treatment is being taken up in an increasing number of districts, but the reports vary much as to the benefits obtained.

Health Education of the Public.

This aspect of public health work is exciting more interest, and some novel methods are reported. Thus Plymouth has a Runsyne machine with an illuminated message fixed at a tram terminus, while Salford has window displays at the health office. The Bootle M.O.H. mentions that Merseyside has adopted a joint programme with a whole-time medical lecturer and organiser, but complains that the Ministry do not pay a grant towards the maternity and child welfare and tuberculosis portions of the work.

A REVIEW OF SCHOOL MEDICINE IN 1927.

THE year 1927, judging from the reports [1] of school medical officers, showed considerable advance in school medicine, though it was retarded by the general financial restriction. Closer coöperation was established between the school service and the general public health work, especially that of the infant welfare centres. The medical officer for Swindon remarks that each year it becomes more anomalous to describe the health of the school child separately from that of the general population. Most of the defects and diseases found in school-children arise during pre-school years, and school entrants who have previously attended infant welfare centres have fewer defects than other children.

Coöperation is assisted by having a medical officer working partly at the welfare centre and partly at the school, by having the cards of the welfare centre sent on to the school when the infant becomes an entrant, by making the dental, aural, orthopædic, and other school clinics available for infants, and by the establishment of nursery schools such as those in London, Manchester, and Bradford. At Leeds and in Leicestershire a comparison has been made between the condition of infants who had suffered from the exanthemata and those who had escaped, with the result, somewhat surprising at first sight, that the difference was slight, and such as it was seemed to suggest that attacks of measles and the like actually reduce the tendency to defects in later childhood. This result may be a tribute to the care now spent on infantile ailments. In many areas a feature of the year has been the inauguration of an orthopædic scheme, including the appointment of a consultant surgeon and the establishment of an orthopædic clinic. Often, too, specially trained orthopædic nurses have been appointed to give massage and electrical treatment in the clinics, or as in Cumberland to visit the homes. Coöperating in this work are also voluntary agencies such as the "Tiny Tims" Clinic at Eastbourne or the Cripples Society at Bristol. Another adjunct is the special school for physically defective children and the open-air school. In the preventive work of correcting and guarding against minor deformities much help is given both at the remedial exercises clinic and (in a wide view) by most of the beneficent activities of the organisers of physical training, and it is appropriate that the practice is spreading of including their reports in one volume with that of the school medical officer.

Coördination in orthopædic work is well seen in Hull, where the victims of an epidemic of poliomyelitis were treated in the City Hospital, seen by the consulting orthopædic surgeon, while splints were fitted at the physical defectives school, remedial exercises and massage given at the orthopædic clinic, and a further example of coöperation lies in the fact that in the case of private patients the special facilities at the clinic were offered to the family doctors, and in the great majority of cases accepted. Open-air schools are giving extended proof of their value wherever they are established; notably favourable factors exist at Torquay and Eastbourne. In some of the great industrial cities there is still delay in meeting an urgent need. Dental work is almost everywhere spreading, consolidating, and organising. At Leeds and Stockport, for instance, one feature of progress is an attempt to eliminate the "casual" cases, that is those who only come for treatment when symptoms like toothache are urgent, and to devote more attention to regular and conservative work. In scattered areas like Cumberland a dental van has been found of value. In some areas dental propaganda, better called dental education, is being vigorously carried on. At Cambridge this has gone on to lectures and examinations for elder girls with excellent results.

A pleasing circumstance is the growing appreciation by the school medical officer of the coöperation and help of general practitioners in securing for school-children prompt treatment of their ailments. At Sheffield this applies to the facilities offered for the X ray treatment of ringworm. At Hull it is the orthopædic clinic; at Bristol it is the rheumatic clinic where it is stated that the response of medical practitioners is admirable. Words such as these may be set against what has been called the encroachment of public health enterprise on private medical work. If inroads have been made on the work and earning capacity of the private practitioner their locus has been for the most part that no-man's land of conditions for which treatment was not hitherto generally available—e.g., refraction of the eye and X rays. There is some truth, too, in the statement that the work of welfare centres and school doctors has attracted the attention of parents to the health of their children, and has thus led them to seek private medical advice more frequently. However this may be, it must be remembered that the private practitioners form the backbone of the profession, so that friction between them and their colleagues in the public health service would be disastrous.

The rheumatic clinics prominent in Bristol and in London, where there is increasing hospital accommodation, are of great importance in preventing invalidity, loss of working time, and premature death in later life.

[1] See THE LANCET, 1928, ii., 37, 93, 328, 501, 1147, 1311.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 22ND, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 201 (last week 176); scarlet fever, 2451; diphtheria, 1350; enteric fever, 31; pneumonia, 1481; puerperal fever, 43; puerperal pyrexia, 95; cerebro-spinal fever, 2; acute poliomyelitis, 3; encephalitis lethargica, 22; dysentery, 11; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 16 counties: London, 6 (Battersea 1, Lambeth 4, Poplar 1); Chester, 3 (Ellesmere Port and Whitby); Derby, 23; Durham, 34 (of these, South Shields 11, Jarrow 14); Essex, 13 (East Ham 4, West Ham 9); Huntingdon, 1 (Old Fletton); Lancaster, 15 (of these, Oswaldtwistle 11); Leicester, 13 (county borough); Northumberland, 21 (Tynemouth); Nottingham, 6; Soke of Peterborough, 3; Stafford, 4; Warwick, 1 (Coventry); Yorks, West Riding, 33 (of these, Halifax 25); Glamorgan, 17; Monmouth, 8.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 25th–26th was as follows: Small-pox, under treatment 17, under observation 2; scarlet fever, 2130; diphtheria, 2098; enteric fever, 16; measles, 44; whooping-cough, 466; puerperal fever, 19 (plus 5 babies); encephalitis lethargica, 73; poliomyelitis, 5; "other diseases," 21. At St. Margaret's Hospital there were 8 babies (plus 1 mother) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 7 (0) from enteric fever, 21 (0) from measles, 7 (0) from scarlet

fever, 52 (12) from whooping-cough, 42 (10) from diphtheria, 65 (13) from diarrhœa and enteritis under two years, and 69 (9) from influenza. The figures in parentheses are those for London itself.

No death occurred from enteric fever, measles, or scarlet fever in London. The fatal cases of enteric fever outside London were reported from Stoke-on-Trent 2, Exeter, West Bromwich, Wallasey, Sunderland, and South Shields 1 each. Stockton-on-Tees and Newcastle-on-Tyne each reported 4 fatal cases of measles, Liverpool and Hull 3 each. (Belfast 7.) Whooping-cough was most fatal in Salford with 6 deaths, Manchester with 4, Plymouth, Warrington, and Leeds with 3 each. Salford reported 6 deaths from diarrhœa, Liverpool and Manchester 5 each, Birmingham 4. The reported deaths from influenza are fewer, but Manchester notified 9.

The number of stillbirths registered during the week in the great towns was 265 (corresponding to a rate of 41 per 1000 births), including 37 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. N. L. Cherry is placed on the Retd. List with rank of Surg. Capt.

Surg. Lt.-Comdr. K. A. I. Mackenzie to be Surg. Comdr.

Surg. Lt. P. J. A. The O'Rourke to be Surg. Lt. Comdr.

J. M. McNamara and M. J. Brosnan to be Surg. Lts.

The following appointments are notified:—Surg. Comdrs.: A. C. V. Green and J. M. Hayes to *Victory*, for Haslar Hospl.; T. R. L. Jones to *Benbow*: and S. W. Grimwade to *Emperor of India*.

ROYAL NAVAL VOLUNTEER RESERVE.

H. H. Bailey to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. L. A. A. Andrews, half-pay list, retires on retd. pay on account of ill-health, and is granted the rank of Lt.-Col.

Maj. C. Russell, from R.A.M.C., Res. of Off., to be Capt.

TERRITORIAL ARMY.

Maj. H. L. Garson to be Lt.-Col., and to comd. the 170th Cav. Fd. Amb.

Capt. H. G. L. Haynes to be Maj.

Capt. A. L. Crockford (late Gloster R.) to be Lt., and relinquishes the rank of Capt.

Lt. J. R. McDonald to be Capt.

F. A. Bevan to be Lt.

INDIAN MEDICAL SERVICE.

Col. C. Hudson to be Maj.-Gen.

Lt.-Col. S. R. Godkin to be Col.

Temp. Lts. to be Temp. Capts.: Rochiram Udhamdas Hingorani, Janardan Madhav Gole, Cheruvari Kottieth Lakshmanan, and Kundan Lall Jetley.

To be Temp. Lts.: Taqiud Deen Ahmed, Muhammad Jafar, Girdhari Lal Kohli, Bawa Harnam Singh, Ved Vias Puri, and Ellamana Siva Rama Menon.

Lt. Surendra Nath Lahiri resigns his commn.

DEATHS IN THE SERVICES.

Col. Peter Broome Giles, C.B., who died at Folkestone on Dec. 19th last, aged 62, qualified with the M.R.C.S. Eng. in 1871, taking the L.R.C.P. Edin. in the following year. In 1897 he obtained the F.R.C.S. Edin. For a time he was in private practice in Herefordshire, and subsequently went to Buckinghamshire, of which county he was High Sheriff in 1907. He was a J.P. for both counties as well as for Folkestone. Always a keen Volunteer he joined the Artists' Rifles, and later, when attached to the Hereford Volunteers, raised the Welsh Border Bearer Company. On the formation of the Territorial Force he was promoted to the rank of Colonel and was appointed A.D.M.S. to the 1st London Division in 1908. During the war he was Commandant of the Military Convalescent Hospital at Alnwick and afterwards at Ashton-in-Makefield, when he was severely wounded in an air raid. Col. Giles, who was created C.B. in 1911, was a County Director of the City of London Branch of the British Red Cross Society, and held the Volunteer and Territorial Force Decorations. He married, in 1879, Florence, daughter of the late J. C. Houghton, of Quinta Brobury, Hereford, and of London, who, with one son and one daughter, survives him.

Correspondence.

"Audi alteram partem."

SOME ASPECTS OF DENTAL SEPSIS.

To the Editor of THE LANCET.

SIR,—Dr. Tallent Nuthall in his interesting paper under this heading in your issue of Dec. 22nd, 1928, writes of the "dead tooth heresy" and states that it is a common thing for radiographic reports to lay stress on the vitality of teeth to the exclusion of other points in attempting to estimate the degree of dental sepsis present. I would suggest that in reality there is no heresy, and that any apparent confusion of thought on this particular point exists among those radiologists who so confidently pronounce a verdict on the strength of a set of films or those doctors who so implicitly accept such reports and pass sentence on the teeth accordingly. A competent dentist will only give an opinion on the presence or not of dental sepsis after a consideration of *all* data, of which the radiological is only a part, and not always the most important part. He may often find very difficult to decide whether there is any sign of infection, and still more, whether teeth should be saved or extracted, but if he knows his pathology he will not have any difficulty in estimating correctly the significance of the pulpless tooth.

As Dr. Nuthall truly states, there are two main forms of dental sepsis: pyorrhœa alveolaris, in which the infection starts at the gum-margin and extends deeply into the bone, and apical infection, in which the infection follows death of the pulp and, passing through the apical foramen, infects the periapical bone. In the first form, pyorrhœa, the dental tissue affected is the periodontal membrane. The pulp, though it may early show signs of degeneration, may remain alive until a late stage of the disease. The gravity of pyorrhœa is estimated by the depth of the pocket, the presence of pus, and, radiographically, by the bony changes. The question whether the pulp is dead or alive has little bearing on the problem of treatment. It is obvious that a pyorrhœic tooth which is also dead has lost so much of its nutrition that its life in any case is limited, but since the majority of the teeth in pyorrhœa are actually vital the decision as to the treatment must be decided primarily by a consideration of the bony changes. Those who would extract dead teeth only (it is inconceivable that there should be dentists among them) would therefore ignore pyorrhœa as a cause of dental sepsis, a reductio ad absurdum!

In the second form of dental sepsis, apical infection, the actual path of the infection postulates the death of the pulp. If it is vital (with rare exceptions which cannot be considered within the limits of a letter) then apical signs in a radiogram will be absent. Those who advocate procedure 4 (see Dr. Nuthall's letter) must equally advocate procedures 2 and 3. What I suppose Dr. Nuthall *may* mean is that a certain school of thought, which has found its most vocal expression in America, has advocated the extraction of all pulpless teeth as a routine measure irrespective of whether they show radiographic change or not on the grounds that they may be infected without radiographic signs, or if not infected they may become so later, and in any case they are pestilent fellows better out of the mouth. This is, indeed, a crude and unscientific procedure which has happily not found much support in this country. It is by no means clear to my mind that Dr. Nuthall is referring to this school, and since his paper may be misconstrued and appears to exhibit some confusion of thought on the pathology of dental sepsis, it appears desirable to make clear that he is really flogging a dead horse, for everyone should know that in pyorrhœa the vitality of the teeth is a minor matter and in apical infection death of the pulp is so necessarily

antecedent to the apical changes that we can take it for granted.

We sadly need accurate criteria as to the indications which demand extraction of teeth because of some general condition, for it must be a distressing reflection to every conscientious dentist that when he decides to extract teeth not in themselves painful and often highly functional he is in effect carrying out a clinical experiment on his patient which involves a mutilating operation, and may frequently fail to improve the general or local condition for which the extraction was prescribed.

I am, Sir, yours faithfully

Brook-street, W., Dec. 28th, 1928. A. T. PITTS.

ASTHMA RESEARCH COUNCIL.

A NATIONAL APPEAL FOR FUNDS.

To the Editor of THE LANCET.

SIR,—In March of last year you were good enough to publish (THE LANCET, 1928, i., 561) the scheme of investigation and research proposed by the Medical Advisory Committee, to be carried out when the financial support of the Asthma Research Council permitted. During the last nine months this Committee has obtained the coöperation of many physicians in the provinces and the consent of their local hospitals to the formation of research centres, when these can be financed by the Council. By means of grants made by the Halley Stewart Trust and the Medical Research Council an asthma clinic and research centre has already been formed at Guy's Hospital to continue Dr. G. H. Oriel's investigation into the biochemical causation and treatment of asthma, and to supplement and control the results of such treatment by comparing them with those obtained by other methods. A second grant by the Halley Stewart Trust has been given for the study of the characteristics of asthma occurring in childhood; and a special clinic is now being organised at Great Ormond-street Hospital to carry out this work. A research Fellow, endowed by the British Humane Association, has already visited many continental spas and is now investigating the results of the physico-therapy methods there employed by means of apparatus installed by that Association. In order to obtain fuller statistics concerning hereditary influences on this disease and on the general asthma syndrome, family history forms have been approved and printed. They can be obtained from the medical secretary; and the Medical Advisory Committee trusts that medical men will assist the inquiry by circulating them among suitable asthmatic patients. The Asthma Research Council itself, having meanwhile been strengthened and reorganised, will inaugurate a national appeal for funds at a Mansion House meeting at 3 P.M. on Jan. 15th. The Lord Mayor will preside and Sir Humphry Rolleston, Dr. A. F. Hurst, Colonel F. E. Fremantle, M.P., and Mr. Ben Tillett, among others, will speak. The attendance of medical men will be much appreciated.

The Council desires to raise a sum of £50,000, and donations should be forwarded to the Hon. Treasurer at the Council's office.

The personnel of the Medical Advisory Committee is as follows: Dr. A. F. Hurst (Chairman), Prof. R. J. S. McDowall (Vice-Chairman), Dr. H. W. Barber, Dr. L. S. T. Burrell, Dr. E. A. Cockayne, Dr. John Freeman, Dr. R. D. Gillespie, Mr. V. E. Negus, Dr. S. Gilbert Scott (London); Dr. James Adam (Glasgow); Dr. John Hay (Liverpool); Sir Thomas Houston (Belfast); Dr. W. E. Hume (Newcastle); Dr. R. Cranston Low (Edinburgh); Dr. J. A. Nixon (Bristol); Dr. F. E. Tylecote (Manchester); Dr. G. W. Watson (Leeds); Dr. W. H. Wynn (Birmingham).

I am, Sir, yours faithfully,

T. T. JEANS,
Surgeon Rear-Admiral (ret.), Secretary, Medical Advisory Committee.

Asthma Research Council, 42, Ranelagh-road, S.W., Jan. 1st, 1929.

RESTRICTED DIETS OR INSULIN?

To the Editor of THE LANCET.

SIR,—The strong influence of American authors upon our outlook on diabetes has somewhat overshadowed the work on this subject being done in Germany and Austria. It may be worth while, therefore, to call attention to the views of Prof. Wilhelm Falta, of Vienna, some of which he has recently summarised.* During more than three months spent in Vienna as Radcliffe Travelling Fellow I have had the chance of studying these methods to some extent and of comparing them with our own, and it is a great pleasure to be able, with Prof. Falta's permission, to review briefly some features of his important work.

Prof. Falta—to whom we owe the introduction of the "Mehl-Früchte-Tage"—bases his treatment of diabetes upon this fundamental object—to give back to the diabetic patient the active, happy, *unrestricted* life of a normal individual. From this follows the simple principle that "insulin should be given whenever we are unable to maintain the nutrition and the bodily and mental activities at a *normal* level without it"; and further, "by means of insulin treatment of diabetes, all extreme forms of diet have become unnecessary, and in general a diet should be given of normal composition in which the individual peculiarities of the patient can be readily allowed for." He thus believes that a diabetic should be dieted like a normal individual and considers that insulin treatment offers us a perfect form of substitution therapy.

Such views are, of course, in direct opposition to those of many authorities, notably of Joslin[1] in America, and in the main to the methods at present employed in England. These methods are based on a belief that the diabetic organism is at fault in more ways than in merely having an inefficient insulin mechanism, and that under all circumstances the patient's diet should be to some extent restricted. The assimilative power of the diabetic organism is supposed to be limited not only in respect of carbohydrate (preformed or potential), but also in respect of total calories as such; and it is believed that any harmfulness of excessive food, especially fat, in diabetes (Joslin) consists pre-eminently in an overload of the total metabolism.

At the same time attention is perhaps too often directed to the disease rather than to the patient. Even should the views of Joslin,[1] Rabinowitch,[2] and others be confirmed, that high diets in diabetes, —though covered with sufficient insulin dosage— exercise a detrimental effect upon the disease, we must, nevertheless, consider whether happiness is not so important to the patient that it should govern our treatment, even at the expense of a possible adverse effect upon the progress of the condition. The psychological effect of constant attention to a restricted diet—an extreme "Minderwertigkeitsgefühl"—is too little regarded, and only too often neglected. If we can restore a normal existence to our patient, and give him the satisfaction of feeling that he is once more a useful member of society, we confer upon him not only a benefit of immense value, but at the same time remove the unfavourable influence that depression, worry, and unhappiness have been shown to exert in diabetes. This has been amply demonstrated by Falta, and the altered mental outlook of the diabetics under his treatment in Vienna is perhaps the most striking impression left after a study of the patients under his care.

The cautions so often urged against giving increased diets with the aid of insulin should especially apply to the diabetes of children. It is in the young, however, that Falta's results are most remarkable, for under

* Neue Probleme des Diabetes Mellitus, Wien. Med. Woch., 1928, lxxviii., 1131 and 1162.

[1] Joslin, E. P.: Treatment of Diabetes Mellitus. London. 3rd edit., 1924.

[2] Rabinowitch, I. M.: Quart. Jour. Med., 1928, xxi., 211.

his régime bodily and mental development proceed as well as in healthy subjects.

For the details of his methods his original papers must be consulted. The chief essential is "schooling of the patient," who must be educated to manage his own diet and taught that his insulin requirements are exactly dependent upon the carbohydrate and protein content of his food. He must know that severe exercise lowers his need for insulin, and that on the first symptom of hypoglycæmia sugar must be taken; he must know that his insulin demand can vary and will lessen with anything that decreases his intake or absorption (e.g., gastro-intestinal disorders); he must be instructed to test his own urine and to increase his dose of insulin when sugar appears. He must be taught, in fact, almost to become his own doctor, though the ultimate control must, of course, remain in experienced hands. That this can be achieved, even with the most poorly educated patients, has been fully demonstrated at Prof. Falta's hospital clinic. Carbohydrate is allowed to about the equivalent of 8 oz. of bread (i.e., 160 g. carbohydrate), and protein to about 100 g., and fats are taken in the amounts that a normal individual would himself choose. "It is purely technical difficulties that prevent me from giving 300 to 400 g. of carbohydrate, although 200 g. of bread-equivalent are in fact sufficient," writes Falta, "and I know of no single reason which under ordinary circumstances should cause us to depart from the dietetic principles applicable to normal man; in fact, every departure has its disadvantage; and though complications may demand variation at times, I aim as soon as possible at a normal diet." Investigations over a long period have convinced him that restricted diets are inefficient, and that removal of sugar and acetone by dietetic means is too often bought at an excessive price. The one-sided diets, such as Petrén's vegetable and fat diet, he regards as unnecessary and often impracticable, and the restriction of carbohydrate and ordering of fast-days—still so firmly advised, despite the introduction of insulin—are, in his opinion, errors of treatment based purely upon theoretical considerations. Fast-days merely upset the insulin dosage, and lower diets limit the bodily nutrition and thus the capacity for exertion. No procedure that threatens the state of nutrition is permitted, and exercise with its beneficial effects upon the sugar tolerance is in every way encouraged. Falta's careful investigations have shown that variations between 100 and 200 g. of fat do not cause any change in the insulin requirements of the diabetic or the output of sugar in his urine, and the work of Widmas,[3] who has emphasised the value of high caloric diets and the negligible influence of fats upon the blood-sugar, supports this view. Thus, with sufficient carbohydrate in the diet, and corresponding dosage of insulin, very large amounts of fat may be utilised without formation of ketone bodies, and man's natural regulator—the appetite—may be allowed to control his caloric intake. Joslin's view that the safest quantity of fat for the diabetic is as little above 50 to 100 g. as possible, must, in the face of Falta's results, be seriously questioned (compare also the work of Wagner [4]).

Adequate insulin dosage may restore efficiency to the islet organ as rest may restore it to the decompensated heart; in cases of acute overstrain of the carbohydrate mechanism ("Ueberlastung und Erschöpfung") such return of function may occur. In some cases, however, the insulin requirements gradually increase (progressive cases); in others they remain for many years stationary. Therefore, the patient's question, whether if he once starts insulin he will ever be able to leave it off, can only be answered with the lapse of time. That actual regeneration of the Langerhan's cells takes place—as some animal experiments lead us to suppose (Herring [5]; also Boyd and Robinson [6])—Falta thinks to be in some cases highly probable. Thus tolerance will often surprisingly improve under his régime, and the increasing good health of his patients, combined with systematic muscular exercises, is often accompanied by much diminished insulin requirements. When the dose, however, has to be raised to 80 or 90 units daily to cover his standard diet, containing approximately 160 g. of carbohydrates, it is thought to represent substitution for a completely degenerate and functionless islet organ, and there can be little hope of any lessening in the need for insulin. Temporary so-called insulin-resistant cases due to increased irritability of the nervous system, or to complicating infectious disease, may also, of course, require equally high dosage.

Falta has thus shown that by a rational nutrition with insulin everything can be attained that is demanded from a substitution-therapy. That his results have justified his technique is amply demonstrated by his patients. Expensive, one-sided, and troublesome diets, which are often almost impossible to maintain in ordinary society, are for the patient abolished, and for the doctor a constant and wearying process of dietetic calculations is replaced by a short period of interesting instruction. The treatment of the diabetic lies with the patient, in his own hands and in his own home. It must, however, be emphasised that superior medical control is essential, and that no tendency to over-indulgence in food or to abandonment of due care by the patient or doctor is in any way suggested.

I am, Sir, yours faithfully,

Dec. 8th, 1928. T. C. HUNT.

[3] Widmas, K.: Études sur le Diabète Sucré chez l'Enfant. Acta Pædiatica, vol. viii., Suppl. 1, Upsala, 1928.

[4] Wagner, R.: Wien. Klin. Woch., 1927, xl., 1 (Sonderbeil, 41).

[5] Herring, T.: Quart. Jour. Exp. Phys., 1927.

[6] Boyd, G., and Robinson: Amer. Jour. Path., 1925, i., 135.

MEDICAL FOUNDATIONS:

A PLEA TO TESTATORS.

To the Editor of THE LANCET.

SIR,—During 1928 I have seen in the press particulars of the wills of fully ten or a dozen medical practitioners who obviously, from the details given, had no dependants. Large sums were bequeathed to various deserving charities, but nothing at all to those charities which should have the first call on members of the profession—that is, Epsom College and the Royal Medical Benevolent Fund.

The bulk of us, of course, have to think first of our families when making a will, but to those who have none, I urge the duty of preference to the proper charities of our own profession. At Epsom College the Council are engaged on the uphill task of collecting money to build a new sanatorium. After a year and a half of effort about one-fifth of the large sum required has been obtained. A few good legacies would enable a start to be made with this most necessary improvement: a fortiori, from those who can afford them, immediate contributions of any size will be most gratefully accepted.

I am, Sir, yours faithfully,

HENRY ROBINSON.

Bramham-gardens, S.W., Dec. 30th, 1928.

SURGICAL ACCESS TO THE BRAIN.

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 8th, 1928, we find on page 1193 an editorial on Surgical Access to the Brain, in which you seem to make a sweeping statement that up to and until the present there has not been a satisfactory means of access to the brain. We therefore enclose to you a bulletin showing the Albee electrically operated instruments which, we believe, are recognised through the world as the most advantageous appliance for this work available, as many of them are sold throughout Great Britain, in fact throughout the world. Thousands of them are in use in America.

On page 1177 of the same issue, Mr. W. H. Ogilvie speaks of the apparatus available previous to his

invention as expensive in first cost and in repairs. Neither statement applies to the Albee outfit. The Albee outfit is not cumbersome, the sterilisation is eminently satisfactory, the leads need not be draped in towels because they are sterilisable, and the Albee perpendicular saw permits of access to recessed bones much better than the drill illustrated in Fig. 2A (page 1178).

In justice to Dr. Fred A. Albee, a New York City surgeon of international reputation, as well as to ourselves who manufacture the Albee instrument exclusively, we feel a correction of these statements is due. We are, Sir, yours faithfully,

THE KNY-SCHEERER CORPORATION OF AMERICA.

Dec. 21st, 1928.

*** We can find no such statement in the leading article. It is expressly stated that there is now on the market, for opening the skull, excellent electrically driven apparatus, which can be sterilised and the speed of which can be readily controlled.—ED. L.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

(*Continued from p. 1364 of last issue.*)

ON Tuesday, Dec. 18th, 1928, the House of Commons went into Committee on the Local Government Bill, Captain BOURNE was in the chair. This was the third allotted day under the guillotine resolution.

Clause 13 provides that as from the appointed day it shall be the duty of every county council and county borough council and other local authority to recover from any person who has been maintained by them in any hospital, maternity home, or other residential institution in which accommodation is provided by the council, other than a person who had become an inmate of an institution for the purpose of receiving treatment for infectious disease, or from any person legally liable to maintain that person, the whole of the expenses or such part as the council are satisfied they can pay.

Recovery of Cost of Treatment.

Mr. SIDNEY WEBB moved to omit the words "it shall be the duty of," which made it obligatory on the council to present the Bill for the full amount. He said that that full amount as the clause stood appeared to include the whole cost of all the medical treatment, however expensive that might be. The North Middlesex Hospital, which was under the administration of the Edmonton Board of Guardians, had just obtained the sanction of the Minister of Health for an expenditure of £6000 on radium to bring its equipment up to date. It was better equipped in many respects than a good many voluntary hospitals. The practice there was to recover from the patients as much as the board of guardians thought it could recover up to the total limit of cost, and in that connexion no question arose. The total cost last year was 49*s.* a patient per week. If the institution was handed over to the Middlesex County Council, as it would be, it would mean that the Act would require the county council to present a bill of 49*s.* a week to every patient who used the institution, although in the case of the board of guardians only about 15 per cent. of the patients paid any contribution, and in 85 per cent. practically nothing was recovered. It would be a very serious change to make if, instead of preventing a bill for 5*s.*, 10*s.*, or 20*s.* up to 49*s.*, according to the means of the person in only 15 per cent. of the cases, the local authority should be required to make the full charge of 49*s.* in all cases. If everyone who went into that hospital was told that he or she would receive a bill necessarily at the rate of 49*s.* a week, without some prospect of the amount being reduced, it would be, he was informed by medical people concerned, a very serious deterrent to people going into that hospital at the earliest possible date. A ward was being fitted up with radium at very great expense for the treatment of cancer. Now every poor woman for whose benefit this was being done would be told that she would be presented with a bill for 49*s.* a week if she went into that hospital. That could not fail to be a very deterrent effect on the use of the hospital. It would not be in accordance with the Minister of Health's intentions or desire to make the emphatic change, and to insist that instead of the bill being graduated according to the patient's means the full amount in each case would have to be presented.

Mr. PETHICK-LAWRENCE, who seconded the amendment, drew the attention of the Minister to the case of the unmarried mother. He said that at present whether the unmarried mother was treated in a voluntary hospital, a special nursing home, or in an institution under a local authority, great care was taken to preserve the secrecy which might be necessary in these cases. Under the clause, however, if the woman herself was unable to produce any money, application would be made at once to members of her family—her father, or whoever might be responsible in law for her. The result of that would be that these women would not go into a home or institution to be treated. To-day it was recognised that it was folly not to help people to fight against infections and venereal disease. Could it be suggested that in regard to cancer and maternity and child welfare the position was different?

Mr. CHAMBERLAIN said that if the amendment were carried they would be exactly where they were at present. Local authorities already had this power. There was nothing in the Bill which said, as Mr. Webb suggested, that the local authority must present a bill for the whole of the expense to a person receiving treatment. It was not contemplated that the local authority should do anything of the kind. They would do precisely what was done now in other cases. They would, through their officers, find out whether a person was able to pay anything, and, if so, how much, and they would make those inquiries before sending in their bill. The object of the clause was to have one rule for both kinds of institutions. If there was not a provision of this sort, the position would be that in the case of a destitute person treated under the poor-law it would be the duty of the local authority to recover the whole of the costs from him, or such part as he was able to pay, but in the case of a person who was not destitute, and was able to pay, there would be a discretion with the local authority. That was a very topsy-turvey state of things, and an anomaly which was being removed by this clause.

Mr. A. GREENWOOD, in supporting the amendment, said that the clause would mean that some of the energy and time of the administration staffs of the public departments would be diverted to the business of collecting money. The Opposition did not so much regard the mere collection of the money as obnoxious, but they thought that the new duty which was imposed on local authorities was bound to be a deterrent, and would lead to numbers of people who ought at an early stage to seek institutional treatment to postpone it or not to go at all.

Dr. VERNON DAVIES said that Mr. Greenwood showed extreme lack of knowledge of the subject on which he had been speaking. Perhaps the hon. Member would allow him (Dr. Davies) as an old medical officer of the poor-law, as a hospital official, and as a general practitioner, to let him know what really happened. In the majority of cases a person who was sick went first of all to his private doctor without any thought of what it was going to cost. The doctor examined him, and if the case required treatment in an institution he sent the man to the institution. In some of the large towns they would find, occasionally, that the patients, instead of going to a doctor, went to the out-patients' department of a voluntary hospital and got some attention there, without any cost at all to themselves. For Mr. Greenwood to say that the Government by this Bill were trying to prevent people seeking medical assistance at the earliest possible moment was to say what was not true, and to put a false construction on the Bill. The people of this country had known for years that they could always get medical assistance either from hospitals, poor-law institutions, or from doctors without any thought of the ultimate cost. Let them take the case of a general practitioner in an industrial district—in the huge majority of cases. That doctor did not ask a patient: "Where is your fee, and then I will tell you what is the matter with you." (Labour cries of "Oh!") Labour Members might speak from rumour or hearsay, but their attitude was a distinct reflection and libel on a most honourable profession. He maintained without fear of contradiction that no man or woman in this country need delay for one moment in getting the most expert advice and the most expert treatment through fear of poverty, or of the cost, and there was nothing in the Bill which would hinder them in the slightest degree. It was absolutely wrong for an hon. Member on the Opposition front bench (Mr. Greenwood) to make the statements which they had heard that afternoon, but he asked hon. Members and the people of the country to notice that this was the policy of the Labour Party, and that the destitute poor should be charged for medical attention but that the public health authorities need not make a charge. They were asking for this—to charge the destitute poor, but not to allow the public authority to do so—and that was a scandal.

After further debate, the amendment was rejected by 236 votes to 130.

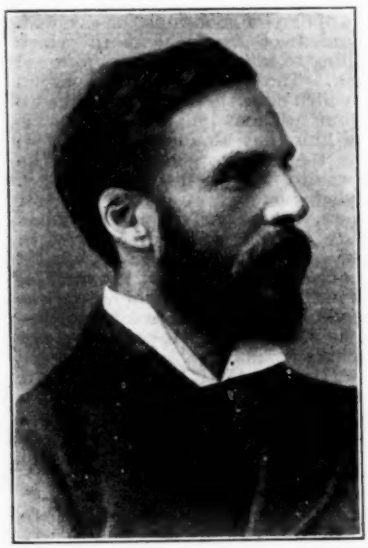
(*To be concluded.*)

Obituary.

DAWSON FYERS DUCKWORTH TURNER, M.D., F.R.C.P., F.R.S. EDIN.

Dr. Dawson Turner, who died at Godalming on Christmas Day, was one of the pioneers of radiology in this country. His influence on its development was considerable, and though an original and inquiring mind went far towards fitting him for his work, he had many other admirable qualities that played their part in making his life exceptionally useful.

Born in Liverpool 71 years ago, he came of a learned family, his father being a well-known classic and headmaster, whilst Joseph Hooker, the botanist, was his cousin. The young Dawson Turner was educated at Shrewsbury, and Dalhousie University, Nova Scotia, where he took an Arts degree in 1884. Returning to this country he went to Oxford and later to Edinburgh, graduating in medicine with honours in 1888. Appointment to the resident staff of the Royal Infirmary followed immediately and Turner became house physician to the late Sir James Affleck, thus beginning a lifelong friendship. In accordance with the custom prevailing at that time he proceeded to visit the principal continental medical schools—Paris and Vienna in particular. Even at this early stage his literary talent showed itself, and he published a short book on skin diseases. He was never much inclined, however, towards the practice of medicine except on its scientific side, and his thoughts began to turn towards physics in its relationship to medicine. It was not long before he started teaching medical physics at the Edinburgh Surgeons Hall, and on the publication of Rontgen's discovery he immediately secured an apparatus with a view to studying the importance of this new development as it affected medicine and surgery. With the plant which was installed at his home in George-square he made extensive experiments, and as precautions were then unknown he contracted a severe dermatitis of the right hand which was to cause him suffering for the rest of his life. A growing interest in the new science induced the managers of the Royal Infirmary to establish a medical electrical department, and in 1898 Turner was asked to join Dr. Milne Murray there as assistant, afterwards becoming his successor. Although now well aware of the danger attending it, he was in no way deterred from continuing experimental work, for with the discovery of radium by the Curies in Paris he immediately secured specimens and began work straight away, lending radium for the use of the Royal Infirmary electrical department until the managers secured a small supply of their own. "During the many years I was associated with him," writes one of his assistants at this time, "I gradually came to admire his originality of thought, his great gifts as a linguist, his facility of expression, and his ability to write papers on any aspect of medical electrotherapy. His 'Practical Manual of Medical Electricity' was for many years a standard work—indeed, up to the time of the war. His 'Radium: Its Physics and Therapeutics' was one of the first publications on this subject in the English language. His paper published in 1906 in the *Transactions* of the British Association on the Hæmorenal Salt Index and Efficiency of the Kidney was epoch-making, and by its means many of his colleagues were able to benefit their patients. It would occupy too much space to detail the papers known by me to have been published by my late chief; I never remember a year, unless laid aside by ill-health, when he did not write at least four."



DR. DAWSON TURNER
At the age of 40.

Turner always took great pains in the preparation of his experiments and demonstrations, alike for his classes—which were always well attended—and for the numerous scientific societies to which he belonged. In these preparations his wife was an interested and devoted assistant. His class in physics at the Surgeons Hall was always popular. He did everything he could to keep these lectures up to date and kept up the interest of his students in a way that few lecturers have the knack of doing. In this he was helped by an unusual personality. Six feet in height and of spare build, with the slight stoop of the student, he had a pleasing dignity and courtesy of manner. His face was grave almost to the point of sternness, but this impression was quickly dispelled by his genial smile. His moods were somewhat variable, and at times he was difficult to understand; but at heart he was one of the most kindly of men, having a gift for making and of keeping friends. The progress of his students in after-life was always a matter of great concern to him; their achievements gratified him and he kept in personal contact with a great number of them.

With an increasing disability from dermatitis it was not long before Dr. Turner's general health was undermined, and in 1911 he had to give up his principal duties as medical electrician at the Royal Infirmary. He was, however, able to take charge of the newly formed radium department, and he kept up his association with the institution over a period of some 30 years, during which he was a familiar figure in medical and scientific circles. It was painful to those who knew him well to see him gradually going downhill and more painful still to know that his sufferings were so long drawn out. Before he finally settled in Surrey two sojourns were made abroad, in Madeira and Switzerland, in the hope of improving his health. Neither, unfortunately, had any lasting benefit. "His enforced retirement from professional work and his severance from the Scottish capital were a great grief to him," writes another of his colleagues, "and in his letters he constantly asked for news of Edinburgh affairs and of his friends there. His fortitude through these long years of increasing disablement and suffering are an inspiration to many."

As an example of Turner's pioneer spirit it may be mentioned that he was the first motor owner and driver in Edinburgh. This pursuit originated in his interest for bicycling as a boy, when he was the owner of one of the high bone-shakers and even competed in cycling races. A love of sport in many forms remained throughout his life. At one time a very good billiard player, he had to abandon this pastime owing to increasing difficulty in holding the cue; but he went on playing golf until within two or three years of his death. From his house at Gullane in East Lothian he was able to enjoy the game on three courses—Gullane, Kilspindie, and Muirfield. His golf bag often excited curiosity and even amusement, for it contained only three clubs, but in spite of crippled fingers and failing eyesight he could still surprise opponents who expected an easy victory, for his accuracy was almost uncanny.

Dawson Turner was a good linguist and a keen musician, and was at one time President of the Royal Scottish Society of Arts. He was also an original member and a vice-president of the Rontgen Society.

He became M.R.C.P. Lond. and F.R.C.P. Edin. in 1890, and was also elected a Fellow of the Royal Society of Edinburgh. His wife, with whom he travelled over a great part of Europe, is the daughter of William Barry, of Romford. She coöperated in every part of his work, and at the same time had the sad satisfaction of attending to his wants during the long illness which it had brought about. For many years she shared with him in dispensing a delightful hospitality in Edinburgh and at Gullane.

CLARENCE LESLIE STARR, M.D. TORONTO.

WE much regret to learn of the death, which occurred on Christmas Day, of Dr. Clarence Leslie Starr, professor of surgery in the University of Toronto, and chief surgeon to the General Hospital in that city.

Clarence Leslie Starr was the son of Milton Starr, of Brooklin, Ontario, and was born in Georgetown, Ontario, in 1868. He was educated at the Whitby College Institute and the University of Toronto, where he graduated in medicine in 1890, and became house surgeon to the General Hospital. He then did much post-graduate work at Vienna and various centres in England, France, and Germany, and studied also for a period at the Bellevue Hospital Medical College, the medical school of New York University. While in New York he was interne at the Hospital for Ruptured and Crippled, and was also assistant surgeon in the out-patient department at the New York Hospital, becoming interested in this way in the subject of pædiatrics. Returning to Toronto he commenced practice there in 1896, and in 1897 joined the teaching staff of the medical faculty of the University as demonstrator of anatomy, a post which he held for four years until his election to the staff of the General Hospital and his promotion to be assistant professor of clinical surgery. The foundation of his well-known work in pædiatrics having been laid in New York, he pursued this branch of practice assiduously in the Hospital for Sick Children in Toronto, where he was appointed surgeon while serving on the staff of the General Hospital, and his various contributions to medical journals and to the American Practice of Surgery largely bear upon deformities of the spine. During the war he served, with the rank of lieut.-colonel, as consulting orthopædic surgeon to the C.A.M.C., and his early death is a real loss to that branch of surgery.

Prof. Starr married Annie Louise, daughter of the Hon. John Dryden, late Minister of Agriculture for the Province of Ontario, by whom he had four daughters.

WILLIAM WARWICK WAGSTAFFE, O.B.E., B.M. OXF., F.R.C.S. ENG.

WE have to record the death, on Dec. 27th, of Mr. W. W. Wagstaffe, surgeon to the Radcliffe Infirmary, Oxford, at the age of 42. His father, who bore the same name, was at one time senior assistant surgeon at St. Thomas's Hospital and the son inherited an anatomical and surgical bent. On leaving Charterhouse he went up to New College, Oxford, and was associated with Sir William Osler in a study of the works of the older anatomists, especially of Vesalius. He took a first class in the honour school of Natural Science in 1908 and then went to St. Thomas's Hospital, whence he qualified three years later. After holding the posts of house surgeon, casualty officer, and surgical registrar, he took charge of the British Red Cross Party sent to Greece during the Balkan War of 1913, and on coming back to England he became F.R.C.S. in 1914. Serving with the British Expeditionary Force throughout the late war he reached the rank of major in the Royal Army Medical Corps. He thus gained an immense surgical experience, especially of head injuries, in which he continued to be interested, as was shown by a recent contribution to our columns. For a short time after the war he acted as first assistant in the surgical unit at St. Thomas's Hospital under Sir Cuthbert Wallace. In 1921 he settled in Oxford as a surgeon and acted as demonstrator in the Department of Anatomy under Prof. Arthur Thomson. He was elected assistant surgeon to the Radcliffe Infirmary in 1924 and surgeon in 1927.

Dr. A. G. Gibson writes: "From the beginning of his work in Oxford we felt we had acquired a colleague who could bear responsibility in surgical work. From his continuous surgical experience following qualification he had attained to an easy familiarity with the main difficulties of surgical technique, and he was not given to adventurous surgery. These qualities made him admirably adapted to the surgical work of the Radcliffe Infirmary, which is very heavy, but which requires a conservative policy, for in the support that it receives from country districts heavy surgical risks without the clear possibility of good must be avoided. The writer is reminded of an incident in which Wagstaffe was unwilling to interfere in a case referred to him for operation. The woman had abdominal pain and vomiting which was thought to be due to slight obstruction, but without physical signs. It was characteristic of him that he allowed himself to be persuaded by his senior colleague which as the issue demonstrated was to the benefit of the patient. He regularly attended medical meetings both in Oxford and elsewhere, where he was a frequent contributor of papers and he spoke frequently in discussions. Neither personally nor professionally had he any showy qualities, but he did his surgical work easily and without fuss, and one could not be but impressed with the solid background of common sense which influenced all he did or said. He was simple in speech and very gentle in manner. I have never heard him say an unkind word, I have never seen him annoyed, and in situations in which other men might have made incisive comment he usually preserved a wholesome silence. We have lost one whose friendship was born of goodwill, a friendship that would have ripened as years went on."

Mr. Wagstaffe married in 1916 Margaret, daughter of Mrs. Cuthbertson, of Broughty Ferry, and there are two children of the marriage. His widow and mother will receive the sympathy of all who knew him.

WILLIAM THORNBOROUGH HAYWARD, C.M.G., M.R.C.S. ENG., LL.D.

WE regret to announce the death at Adelaide on Dec. 21st last of Colonel W. T. Hayward, hon. consulting physician to the Adelaide Hospital, and a much respected member of the medical profession in Australia. He was born at Reading on June 26th, 1854, educated at St. John's College, Hurstpierpoint, and the Liverpool School of Medicine. After qualifying L.R.C.P. Irel. and L.M. in 1874, and taking the M.R.C.S. Eng. in the following year, he held some resident hospital appointments before leaving for South Australia in 1878. Settling at Norwood, he soon became attached to the General Hospital at Adelaide, where he was on the full medical staff for a period of 30 years until 1914, when he resigned to join the Australian Imperial Force and was appointed a member of the governing body. He lectured on clinical medicine and materia medica at the University, serving also on the council. He became president of the Permanent Medical Referee Board of the A.A.M.C. (4th Military District) and was a vice-president of the British Medical Association at the time of its Aberdeen meeting in 1914, when he received honorary degrees from the Universities of Aberdeen and Adelaide in recognition of having devoted his great administrative abilities to organising the profession of medicine throughout the Commonwealth. He was 60 years of age at the outbreak of the war, and for three years, 1915–18, was in charge of the Australian Auxiliary Hospital at Harefield. For his services he was made C.M.G. in 1919. Colonel Hayward married Florence, daughter of the late P. H. Burden, of Adelaide, by whom he had one son.

Medical News.

UNIVERSITY OF OXFORD.—At recent examinations the following candidates were successful:—

B.M., B.Ch.

Medicine, Surgery, and Obstetrics.—A. R. Bowtell, S. B. Davis, R. M. J. Harper, *G. G. Hill, R. G. Macbeth, D. C. Shields, *Margaret A. L. Herbertson, and *Joyce Wright.

Pathology.—G. H. Bateman, Fairfax Bell, J. F. Brock, J. L. Clapham, Arthur Guirdham, M. A. Hatt, J. C. Leedham-Green, W. H. McMenemey, *J. C. Neely, J. N. O'Reilly, R. S. B. Pearson, B. T. Squires, Anne D. M. Adams, Olive M. Capper-Johnson, Amy C. E. Clarke, and Victoria M. Robinson.

Forensic Medicine and Public Health.—H. R. J. Donald, J. A. Eddy, R. G. Macbeth, H. E. Mansell, *J. C. Neely, J. C. Nicholson, G. P. Roxburgh, W. J. Walter, H. G. Wells, and Ruth Sandeman.

Materia Medica.—P. M. F. Bishop, J. F. Brock, J. M. L. Burtenshaw, E. C. Coaker, W. J. Cotton, R. F. Lomax, and R. L. H. Townsend.

* Received their degrees on Dec. 17th.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—E. A. Johnstone, Manchester and Charing Cross Hosp.; E. A. Lipkin, Liverpool and Charing Cross Hosp.; D. M. Nightingale, King's Coll. Hosp.; A. K. Rama Chandra, Edinburgh; and R. W. Scanlon, St. Thomas's Hosp.

Medicine.—W. S. Ghai, Charing Cross Hosp.; D. H. Haler, King's Coll. Hosp.; K. R. Lundeberg, Minnesota, U.S.A.; K. G. Milad, St. Mary's Hosp.; T. A. P. Proctor, Birmingham; A. K. Rama Chandra, Edinburgh; and H. Tenenbaum, Nancy and London Hosp.

Forensic Medicine.—W. S. Ghai, Charing Cross Hosp.; D. H. Haler, King's Coll. Hosp.; C. K. McCoan, St. Mary's Hosp.; J. H. McGibbon, Glasgow; K. G. Milad, St. Mary's Hosp.; and T. M. White, Bristol.

Midwifery.—W. D. Glynn-Jones, Guy's Hosp.; D. H. Haler, King's Coll. Hosp.; K. G. Milad, St. Mary's Hosp.; B. J. Niall, London Hosp.; K. M. Seedat, Charing Cross Hosp.; and T. M. White, Bristol.

The Diploma of the Society was granted to the following entitling them to practise medicine, surgery, and midwifery: W. S. Ghai, E. A. Lipkin, K. G. Milad, E. A. Johnstone, K. R. Lundeberg, T. A. P. Proctor, W. D. Glynn-Jones, A. K. Rama Chandra, and H. Tenenbaum.

THE death is announced of Sir George McCrae, Chairman of the Scottish Board of Health from 1919 to 1922.

EAST LONDON HOSPITAL FOR CHILDREN.—A clinical afternoon will be held at this hospital, Glamis-road, Shadwell, E., on Wednesday, Jan. 9th, at 4 P.M., when the subject of discussion will be Diseases of the Alimentary System. Medical practitioners are invited (tea 3.45 P.M.).

NATIONAL ASSOCIATION FOR PREVENTION OF INFANT MORTALITY.—A course of lectures on the Early Detection and Prevention of Defects and Disease in Young Children, intended mainly for health visitors, nurses, midwives, and superintendents of infant welfare centres, will be given in the Lecture Hall of the Infants Hospital, Vincent-square, Westminster, S.W., on Mondays, from 6.30 to 7.30 P.M., from Jan. 7th to March 11th. The lecturers will be Dr. F. J. Poynton, Dr. Eric Pritchard, Dr. W. E. Robinson, Dr. A. G. Maitland-Jones, Dr. C. Worster-Drought, Mr. Alan Todd, Dr. Donald Paterson, Dr. Letitia Fairfield, Dr. R. C. Wingfield, and Mr. H. R. Jeremy. Tickets may be had from the hon. secretary of the Association at 117, Piccadilly, London, W.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At 8.30 P.M. on Friday, Jan. 11th, at the West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, London, Mr. Lindsay Rea will give a demonstration on the Fundus Oculi. This demonstration is limited to 12 persons and is especially designed for candidates for the M.R.C.P. examination. Application for attendance should be made to the Fellowship (Tel.: Mayfair 2236). From Jan. 14th to 25th an intensive course will be held at the National Hospital for Diseases of the Heart. The entry is limited to 20 and early application is therefore desirable. An all-day course will be given at the Queen's Hospital for Children from the 14th to the 26th, and the staff of the Prince of Wales's General Hospital will hold an intensive course in medicine, surgery, and the specialties, primarily intended for practitioners, from Jan. 28th to Feb. 9th (daily from 10.30 A.M. to 5.30 P.M.). A series of lecture-demonstrations in Psychological Medicine will be given on Tuesdays and Saturdays at 11 A.M., from Jan. 29th to Feb. 23rd, at the Bethlem Royal Hospital. Copies of all syllabuses, together with information about the General Course arranged by the Fellowship, may be had from the Secretary at 1, Wimpole-street, London, W.

Mr. Robert Ollerenshaw, clinical lecturer in orthopædic surgery in the University of Manchester and orthopædic surgeon to the Royal Manchester Children's Hospital, has been elected a member of the French Orthopædic Association.

DEVONSHIRE HOSPITAL, BUXTON.—This hospital has received a bequest of £5000 from the trustees of the late Mrs. Ada Mary Cryer, of Rochdale, for the endowment of five beds to be known as the Cryer beds, for the free use of patients of the county borough of Rochdale.

GREENOCK EYE INFIRMARY.—More than 5400 patients were treated at this hospital during the year, 4100 of whom were males. There were 2400 cases of the removal of minute pieces of metal and other substances.

S. R. WILSON MEMORIAL PRIZE.—It is announced by the editor of the *British Journal of Anæsthesia* that the prize of £50 given in memory of Dr. S. R. Wilson for research on inhalational anæsthesia has been awarded to Dr. Florence Violet Stephen, M.Sc., who is at present working at the Manchester Royal Infirmary.

POST-GRADUATE LECTURES AT ROYAL NORTHERN HOSPITAL.—A series of lectures and demonstrations will be held at this hospital on certain Tuesday afternoons from January to April, and will be succeeded by three lectures at the Royal Chest Hospital on Wednesdays in May. A fortnight's special course in gastro-enterology will begin on Jan. 28th, and from Feb. 18th to 22nd an "intensive week" of post-graduate lectures has been arranged, including teaching in wards and other departments during the morning. Notices of the weekly lectures will be found in our Medical Diary, whilst particulars of the special courses and of other post-graduate work may be had from the Dean of the Hospital, Holloway-road, London, N.

Appointments.

DATE, W. ADLINGTON, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Honorary Assistant Anæsthetist to the Royal Devon and Exeter Hospital.

GILMORE, E. R. W., M.B., Ch.B. Manch., D.P.H., D.T.M., Medical Officer of Health at Port Louis, Mauritius.

HEALY, T. M., M.B., B.Ch. N.U.I., Master of the Coombe Hospital, Dublin.

MAGUIRE, T. J. R., M.B., B.Ch. N.U.I., D.P.H., Assistant Medical Officer of Health, Cork.

London Jewish Hospital, Stepney Green, E.: KRESTIN, D., M.D., M.R.C.P. Lond., Honorary Assistant Physician; and MANDEL, L., M.D., M.R.C.P. Lond., Honorary Physician (promoted).

Consideration is being given to the appointment of an additional Ophthalmic Specialist Medical Referee under the Workmen's Compensation Act for the following county courts in Circuit No. 31: Aberayron, Aberystwyth, Cardigan, Carmarthen, Lampeter, Llandilo Fawr and Ammanford, Llandovery, Llanelly, Narberth and Haverfordwest, Neath and Port Talbot, Newcastle-in-Emlyn, and Pembroke Dock. Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than Jan. 19th.

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Jun. Res. S. £250.

Brighton, Royal Sussex County Hospital.—Jun. Asst. Pathologist. £250.

British Pharmacopœia Commission, 44, Hallam-street, W.—Secretary. £500.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Central London, Throat, Nose and Ear Hospital.—Two Hon. Asst. Out-patient Registrars.

Chester, Royal Infirmary.—Third Hon. Surgeon.

Doncaster Royal Infirmary.—Second H.S. £150.

Great Yarmouth, General Hospital.—H.S. £150.

Guildford, Royal Surrey County Hospital.—Hon. Asst. Surg.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300. Also Anæsthetist. 15 gns.

Hove, Lady Chichester Hospital.—H.P. Also Jun. H.P. At rate of £100 and £50 respectively.

Ilford Emergency Hospital, Ilford, Essex.—Jun. H.S. £100.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Lahore, Dental Hospital.—Dental Surgeon. Also Dental Mechanic. Rs.1000–50—1500 and Rs.400–20—800 per mensem respectively.

Leamington, Warwickshire and Coventry Joint Committee for Tuberculosis.—Asst. Tuber. O. £650.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Liverpool, Mill-road Infirmary, Everton.—Res. Asst. M.O. £200.

Llangwyfan, near Denbigh, North Wales Sanatorium.—Third Asst. Res. M.O. £250.

L.C.C., Mental Hospital Service.—Eighth Asst. M.O. £300.
L.C.C.—Temporary Asst. M.O.'s. 30*s.* per session.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 guineas.
Lowestoft, S. Luke's Hospital.—Jun. Asst. M.O. £500.
Manchester, Ancoats Hospital.—Res. M.O. £150.
Manchester Royal Infirmary.—Four H.P.'s. Each at rate of £50. H.S. to Aural, Gynæcological, and Ophthalmic Dept. At rate of £50. Also Five H.S.'s. Each at rate of £50.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.
Metropolitan Asylums Board Mental Hospital Service.—Jun. Asst. M.O. £500.
Nottingham, Bagthorpe Institution and Infirmary.—Res. Asst. M.O. At rate of £300.
Oswestry, Shropshire Orthopædic Hospital, &c.—H.S. £200.
Paddington Green Children's Hospital, W.—Two Hon. Surgeons.
Port Said, British Hospital.—Res. Asst. M.O. £350.
Preston and County of Lancaster, Queen Victoria Royal Infirmary. H.P. £190.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Army Medical Corps.—Twenty-five Commissions.
Royal Northern Hospital, Holloway, N.—Obstetric Physician.
St. John's Hospital, Lewisham, S.E.—Res. Cas. O. Also Jun. House Officer. Each at rate of £100.
St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Ednell-street, W.C.—H.S. At rate of £150.
St. Thomas's Hospital.—Obst. P. Also Obst. P. in Charge of Out-patients.
Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill.—Hon. Asst. Physician.
Staffordshire Mental Hospital, Cheddleton, Leek.—Second Asst. M.O. £650.
Sudan Medical Service.—M.O. LE.780.
Swansea County Borough.—Asst. M.O. £600.
University College Hospital, Gower-street, W.C.—Hon. Clin. Asst. to Ophth. Out-patient Dept.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. Also H.S. Each at rate of £100.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. Also Jun. H.P. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—House Anæsth. At rate of £50.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £200. Also Specialist Consultants. Special Fees.
Willesden General Hospital.—Clinical Assistants.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.
The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Lockersbie (Ayrshire) and Llansawel (Carmarthenshire).

Births, Marriages, and Deaths.

BIRTHS.

CORSI.—On Dec. 29th, 1928, the wife of Henry Corsi, F.R.C.S., Harley-street, W., of a son.
MACKAY.—On Dec. 29th, 1928, at Blackheath, the wife of S. Ruthven Mackay, R.A.M.C., of a son.
PYPER.—On Dec. 18th, 1928, at The Old Ford House, Blandford St. Mary, the wife of Major J. C. Pyper, I.M.S., of a daughter.
WIGHT.—On Dec. 27th, 1928, the wife of Cecil H. Wight, *M.C.*, M.R.C.S., L.R.C.P., of Wangford, Lowestoft, of a daughter.
WORSELDINE.—On Dec. 21st, 1928, in London, the wife of Stanley C. H. Worseldine, Captain, I.M.S., of a daughter.

MARRIAGES.

CROFT—LEE.—On Dec. 29th, 1928, at All Saints' Church, Compton, Winchester, Charles Richard Croft, B.A., M.R.C.S., L.R.C.P., to Phyllis Mary, only daughter of Mr. and Mrs. A. C. Lee, of Hatch Thoke, Compton.
GILMORE—FORSYTH.—On Dec. 22nd, at St. Cuthbert's, Withington, E. R. W. Gilmore, M.B., Ch.B., D.P.H. Viet., D.P.H. Lond., D.T.M. Liverp., second son of Mrs. Gilmore, of Fallowfield, Manchester, and the late R. O. Gilmore, LL.B., to Ella, only daughter of Mr. and Mrs. Hy. Forsyth, of Athol-road, Manchester, and of Northsyde, Berwick-on-Tweed.
RUTHERFORD—FLECK.—On Dec. 28th, 1928, at Wilton Parish Church, Hawick, N.B., Andrew Rutherford, M.B., F.R.C.P. Edin., to Mary Rose, widow of James Fleck, C.A.

DEATHS.

HOLMES.—On Dec. 24th, 1928, at Foxhall-road, Nottingham, Dr. T. E. Holmes, M.A., M.D. Camb. and Lond., County Medical Officer for Nottinghamshire.
MAKALUA.—On Dec. 31st, 1928, at Warrior-square, St. Leonards-on-Sea, Matthew M. Makalua, M.R.C.S., L.R.C.P.
STARR.—On Christmas Day, at Toronto, Dr. Clarence Leslie Starr, Professor of Surgery at the University of Toronto.
TURNER.—On Christmas Day, 1928, after long suffering from his pioneer X ray work, Dawson Fyers Duckworth Turner, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE FRENCH MEDICAL SERVICES IN THE WAR.

GENERAL MIGNON'S STORY.

Inspector-General A. Mignon, D.M.S. of the Third Army, was stationed in the Verdun area from the commencement of the war to November, 1918, when he was retired just before the Armistice on account of age. A practised author, with several books to his credit, he had been the Director of the Army Medical School at Val-de-Grâce when war broke out, and has lately been given facilities for reading original documents. He is thus well qualified to give an account of the development and service of the French medical corps throughout the war.[1] His work is arranged in four well-printed volumes, the first describing the period of education, the second, Verdun, the third, 1917 and 1918, while the fourth embodies reflections and deductions from a survey of the whole period. Military surgeons must in times of peace imagine what they will have to do in war. In the past manœuvres instructed only junior officers, the schemes of seniors were not criticised, and the staff appeared to think that removal of wounded from the battlefield was all that was required from the medical service. In the war the lack of coöperation between the medical and the General Staff was at first a serious impediment. Administrative difficulties were great: if small-pox broke out, 20 telegrams must be sent before one man was vaccinated. Antityphoid inoculation had been ordered to begin in October, 1914 (the vaccine, an autolysate, gave more reaction than the English), and General Mignon could not get any when he applied for it in August, 1914. The generals all wanted the wounded made comfortable, but administration was with the Chief of Staff; the Staff moved the medical units and the D.M.S. could neither detail his staff, nor get news of any intended operations. At first all wounded were sent down: blankets, food, medical instruments were lacking. In 1914 a mobile operating room, sent up by the Duchesse d'Uzès and Prince Platoff, did splendid work but was unapproved, and it was not until 1915, when the surgeons of Paris sent up another, that these mobile units became generalised. At first the trains for wounded were ill-equipped, slow, and gave no food, and there was but one section of motor ambulances. When the author had many casualties and few hospital beds, he asked to be given barracks, and got them, it being less hurtful to a sound man than to a sick one to sleep in a tent. The needs of the medical service had not been visualised; no one had stood up for the medical officer, or rather for the wounded and sick whom he protects. In treating wounds at first too much iodine was used, then came ether, and Abadie, of Oran, got striking success with 7 per cent. NaCl, but all antiseptics tried gave poor results. Then came Dakin's solution, and with the excision of wounds, Carrel-Dakin's method worked wonders. As to hygiene, in October, 1914, typhoid (335 cases) was recognised at Verdun. In 17 months the Third Army had 39,712 cases with 3384 deaths; the numbers for the same period in the B.E.F. are quoted as 2796 with 178 deaths (p. 535). The French soldier is not a drinker of hot water, like the Englishman, but chlorination of water stopped typhoid. Company officers took the greatest trouble in looking after their men, getting them dining-rooms to keep flies out of sleeping places, finding better clothes for them and steel hats; baths were set up in 1915, a laundry in 1916.

Verdun.

Mignon, when D.M.S. of the Third Army, was on Feb. 1st, 1916, put in medical charge of the adjacent but distinct Fortress of Verdun. On Feb. 9th he received information that the Germans would attack on the 15th. The hospitals were cleared in 48 hours, medical and venereal cases sent away, and stores were obtained. Mignon planned to link forward and rear units so as to get quick evacuation for wounded, and tried to collect surgical units. The Third Army sent him orderlies, stretcher-bearers came from Paris, and with their help a hospital of 350 beds was built at Baleycourt, and others were rearranged, restaffed, re-equipped. On Feb. 15th came a fierce storm of snow and bitter cold, so some extra time was gained; but it cleared suddenly on Feb. 20th, and on the next day the shelling began. Aid posts, field ambulances were swept away. One division lost 21 doctors; hospitals came under fire, and Baleycourt had to close on Feb. 28th. Throughout the next four months the routes of evacuation and the positions of hospitals were

[1] Le Service de Santé pendant la Guerre, 1914–18. By Médecin Inspecteur-Général A. Mignon. Paris: Masson et Cie. In four volumes. Vol. I., pp. 697, 1926; Vol. II., pp. 690, 1926; Vol. III., pp. 703, 1926; Vol. IV., pp. 831, 1927. Fr.240.

constantly changing. The first thing to provide in a new place was a surgical unit, with beds around it, then an examining post outside the hospital to feed and dress walking wounded, sent on by returning supply lorries. Later hospital huts were put closer together to save fatigue to the staff. Connecting wooden paths proved dangerous, for they burned one hospital in an air raid. General Mignon emphasises the importance of having subsidiary hospitals into which to relieve evacuation hospitals when these are likely to be submerged in a sudden flood of casualties.

The Somme and After.

The third volume deals with the Somme in 1916, the battles of 1917, the German attacks of 1918, and the victorious advance of 96 days before the Armistice. Preparing for the Somme, medical officers were directed to keep the walking wounded in the army areas, to take out of the areas the seriously damaged, and to make comfortable arrangements for the others. Large hospitals were placed 10 miles behind the lines, but they had not enough surgeons, so Amiens had to take the overflow. Before the battle of the Aisne (April, 1917) Parliament had disestablished the Director-General of the Armies, who was in fact replaced by a captain of the General Staff. General Nivelle had no medical officer on his staff either, and the new M.O.'s of the armies concerned were not told the idea nor the zero. The hospital scheme, devised in Paris, was too ambitious and not completed in time. Weather turned against the force, and the senior medical officer of the flank army had hastily to hospitalise 2652 lighter cases in a village. The attack failed, and the medical units were swamped. One of 1300 beds had 6000 cases to deal with. Visiting members of Parliament were shocked, and the medical service was blamed, but as our author, with scientific detachment, observes, the War Office should take the blame for the failure of its own scheme, or alternatively the General who underestimated his probable losses and engaged before the medical arrangements were completed. Later the medical officers got better information and their organisation was improved. In the 1917 offensives in Flanders the plans of the Paris Society of Surgeons were accepted: walking wounded were early separated, the best surgeons of Paris, at the front, cleaned the wounds at once, and patients were sent to the rear for suture, with excellent results, partly because only half the expected wounded appeared. In the German offensive of March, 1918, when the front was bent, chaos reigned. It is little use sending up a division in relief without its medical units, and these can do nothing without equipment. The month before July, 1918, when the 96 days of final advance began, the armies had been told to prepare to advance, and hospitals to divest themselves of extra stores. Gas was now a great trouble; the faster the Germans retired the more gas they sent over. A service for gassed men was set up parallel to that for wounded. In October cold became a difficulty, but especially influenza (36,304 cases that month); other diseases seemed to hold up in its presence. Barges made good means of evacuation. The hospitals of evacuation had by now many special divisions, eyes, face, and so forth. Divisional and forward units only prepared cases for evacuation; surgery was done by corps units or behind. This proved to be the best system.

Reflections and Deductions.

In his fourth volume, of reflections and deductions, Inspector-General Mignon expresses the view that the great cause of the success of the medical service in the war was the assimilation of the civil medical profession into the army. Military medical officers remained in touch with the command, and provided for the civil profession the means for doing their work, which was the care of the sick and wounded. Surgery was no longer thought a general service duty, but was restricted to specialists, and similarly other branches of medicine. The military medical service had itself undergone evolution. At the close there was a medical officer on the staff of every general; the medical officers knew how many casualties to expect, and when and where; they moved their units and sent the sick to whatever place they considered most conducive to a speedy recovery. They have not even yet got full command in their hospitals, nor the complete autonomy of a corps. Originally governed by a director on the "7th Direction" of the General Staff, after a year of war the "Service de Santé" was put under an Under Secretary for War. An Under Secretary of State is less hampered than a soldier by precedent, or by finance, and he has a numerous staff to help him; through his agency came consulting surgeons and physicians, inter-Allied surgical conferences, increased autonomy, and more reasonable relations with the command. When he relieved Nivelle Pétain felt that the Service de Santé was insufficiently represented at Headquarters, and added an inspector there to advise on coördination. Thus, thanks to many motor vehicles and to better relations with the railways, the war ended more comfortably for the wounded than it began; at least 80 per cent. of them were made fit to return to the line. The author's final conclusion as to the best method of procedure appears to be that divisional and forward units should collect the wounded, do first-aid, fill up the field cards correctly if possible, and deliver the patients to Corps, at the head of the car line, where the consulting surgeon will examine them, send the walking wounded in lorries some 100 miles back, retain untransportable cases (on whom he himself may operate, if he has time), and send the others to the hospitals of evacuation, special or general, 12 or more miles to the rear. Thus will the front be cleared to the best advantage, and thus also will the patients recover best. Inspector-General Mignon hopes there will never be another war, but fears that as usual, people will forget the horrors, and that increasingly as time goes on, only the self-sacrifice and nobility of the soldiers will be recalled. Therefore it is essential to remember the steps which eventually led to the building up of a fine Service de Santé.

THYROID METABOLISM, IODINE, AND VITAMINS.

THE remarkable effect of iodine in exophthalmic goitre is now well known, though it is not yet understood how it is brought about. In almost every case iodine causes an immediate slowing of the pulse-rate, lessening of the nervous symptoms and exophthalmos, and a fall of basal metabolic rate (B.M.R.) often to normal. These effects are not permanent, and usually there is a relapse after a few weeks, even though iodine is continued. The relationship of hyperthyroidism induced by thyroid feeding to exophthalmic goitre is not clear, but it is recognised that the latter is a more complicated condition than can be induced by mere excess of thyroxin. In this connexion the observations of D. A. Carson and William Dock [1] on the action of iodine on hyperthyroidism produced in man by thyroid feeding are of interest. They point out that the evidence on this subject from animal experiments is contradictory and they have been fortunate in being able to observe the effect of iodine on artificial hyperthyroidism in four male patients. Hyperthyroidism of the type commonly seen in human beings was first caused by thyroid feeding in four adult males, an increased basal metabolic rate of between 20 and 30 per cent. being obtained in each case. Lugol's iodine was then given and the effect on the clinical condition and B.M.R. was observed. In Case 1 the giving of iodine coincided with a reduction in dosage of thyroid, so the experiment was vitiated; in Case 2 iodine was given for three days only, but no effect could be observed; in Cases 3 and 4 six days' iodine therapy had no effect whatever on clinical signs or B.M.R. Carson and Dock think that this negative effect in patients with a healthy thyroid gland suggests that in pathological hyperthyroidism the gland itself is the site of the action of iodine. They also regard these results as further evidence against the theory of a qualitatively perverted secretion. It might, however, be argued that they are in accord with Plummer's theory that the symptoms of exophthalmic goitre are due in part to the secretion by the thyroid gland of an iodine-deficient catalyst and are therefore partially relieved by iodine, whereas those of simple oversecretion of the gland are not affected by iodine.

The relation of vitamins to iodine metabolism is another aspect of the subject that has been under consideration. D. Harvey,[2] of the Rowett Research Institute, has observed that if cod-liver oil (which contains iodine) is given to goats it causes more iodine to pass into the milk than is obtained when the goat is fed on equivalent amounts of potassium iodide and olive oil. From this it was deduced that some effect on iodine metabolism might be got from specific constituents of cod-liver oil, and good results have been reported in cases of Graves's disease with a preparation (vitiodum) which consists of iodised jecoleic acid incorporated with a vitamin concentrate from the oil. Some results of this treatment are reported by G. L. Adamson and A. T. Cameron,[3] of the University of Manitoba. These observers studied the effect of the combination in 12 cases of exophthalmic goitre, and found that it is as effective as Lugol's solution, and that its effects are equally limited. The same initial fall of basal metabolism was observed as with Lugol's solution, and this was accompanied by the same fall in pulse-rate and clinical improvement. With continued treatment there was usually a slight relapse, and withdrawal was followed by a rapid rise in the patient's B.M.R. and pulse-rate. For some cases the vitiodum was divided into two parts, one containing the iodised fatty acid only and the other the vitamins A and D only. In four cases these were given separately at first and later in combination. Two of these showed no definite lowering of the B.M.R. when the vitamin fraction was given alone, but one of these afterwards responded

[1] Amer. Jour. Med. Sci., 1928, clxxvi., 701.
[2] Biochem. Jour., 1927, xxi., 1268.
[3] Canad. Med. Ass. Jour., 1928, xix., 420.

satisfactorily to Lugol's solution, and the second to vitiodum. Two others which failed to respond to the iodised fatty acid fraction both gave a characteristic remission with vitiodum. While admitting that the number of cases is insufficient for definite conclusions, the authors suggest that the combination of iodised fatty acid and vitamins is necessary for a definite effect. Whether one or both vitamins are necessary, and whether the iodised fatty acid can be satisfactorily replaced by other iodine compounds has yet to be proved. They think that this may be an example of positive vitamin action which should be carefully studied because it is in contrast to their negative action in deficiency diseases. They apparently do not consider the small amount of iodine present in vitiodum enough by itself to produce the effect of the much larger amount of iodine in Lugol's solution. It is strongly emphasised that further work is necessary both to confirm the results and to investigate the possible relationship between vitamins A and D, the thyroid and iodine metabolism.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 8th.—5 P.M., THERAPEUTICS. An informal discussion on the Treatment of Established Diabetic Coma. The following have been invited to take part: Dr. E. P. Poulton, Dr. George Graham, Dr. R. D. Lawrence, Prof. MacLean, Dr. Otto Leyton, Prof. H. H. Dale, and Dr. P. J. Cammidge. 8.30 P.M., PSYCHIATRY. Discussion: Light Therapy in Mental Hospitals. Speakers: Dr. H. Dove Cormac, Dr. A. C. Hancock, Dr. G. de M. Rudolf, Sir Henry Gauvain, and Dr. R. Bourdillon. ELECTRO-THERAPEUTICS. Members of this section are cordially invited to attend the discussion.

THURSDAY.—5 P.M., BALNEOLOGY. Papers: Dr. David Brown and Dr. Woodmansey: The Excretion of the Constituent Ions of Sulphur Water in Fæces, Urine, and Sweat. Mr. Joseph Race: The Sedimentation Test. THERAPEUTICS AND PHARMACOLOGY. Members of this section are cordially invited to attend the meeting of Section of Balneology. 8 P.M., NEUROLOGY. Clinical meeting at National Hospital, Queen-square.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers: Mr. M. L. Hepburn: An Attempt to Classify (Pathologically) the Various Fundus Pictures in Diseases of the Choroid. Mr. M. S. Mayou: Juvenile Glaucoma.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, Jan. 8th.—4 P.M. (in the Rooms of the Medical Society of London, 11, Chandos-street, W.), Miss C. Chisholm, M.D.: Alcohol and Drug Addiction in Relation to Women and Children. Discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 7th, to SATURDAY, Jan. 12th.—WEST END HOSPITAL FOR NERVOUS DISEASES, Gloucester Gate, Regent's Park, N.W. Fri., at 8.30 P.M., demonstration on the Fundus Oculi by Mr. Lindsay Rea. Ophthalmoscopes required. Especially suitable for M.R.C.P. candidates. Further particulars from Secretary, Mayfair 2236.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Jan. 7th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 8th.—3.15 P.M., Mr. L. E. Barrington-Ward: Modern Methods in Treatment of Malignant Diseases.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Jan. 7th.—1.30 P.M.: Methods of Examination and Diagnosis Courses—Hearing Tests.

WEDNESDAY.—1.30 P.M.: The Sinuses.

FRIDAY.—4 P.M., Mr. H. Kisch: Nasal Obstruction.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, Jan. 10th.—5 P.M., Dr. W. N. Goldsmith: General Eruptions in Children.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.

TUESDAY, Jan. 8th.—5.30 P.M., Prof. A. Bostock Hill: Cleanliness: Is it the Basis of Health? Discussion.

LEEDS MEDICAL SCHOOL.

WEDNESDAY, Jan. 9th.—3.30 P.M., Prof. W. Blair Bell: Lead in the Treatment of Cancer.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.

FRIDAY, Jan. 11th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Fletcher Shaw: Delayed Labour.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1372.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett, Sir Hugh Rigby, and Lord Dawson of Penn:—

THURSDAY, DEC. 27TH, 1928. 8.20 P.M.

During to-day His Majesty's condition has not been so satisfactory. There has been disinclination to take nourishment, and the strength has been less well maintained.

FRIDAY, DEC. 28TH. 11.45 A.M.

The King had a fair night with quieter sleep towards morning. There is less difficulty with the taking of nourishment, and the general state has improved during the last 12 hours. At a consultation this morning the progress of the past week was reviewed. During that period there has been a definite improvement in the local condition. On the other hand, the general condition, as evidenced by weight and strength, does not show the same progress. Measures best adapted for meeting this difficulty were considered and determined. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

8.15 P.M. The King has had a restful day. The slight improvement noted this morning is maintained.

SATURDAY, DEC. 29TH. 11.30 A.M.

The King has had a quiet night, and there is a very slight change for the better in His Majesty's condition.

8.15 P.M. The King has had a quiet day. The slow improvement noted this morning continues. No bulletin will be issued till to-morrow evening.

SUNDAY, DEC. 30TH. 8.30 P.M.

The King has had a quiet day. There is no change to report in His Majesty's condition.

MONDAY, DEC. 31ST. 11.55 A.M.

The King has passed a somewhat restless night. The general condition is maintained, although as previously noted the state of exhaustion still presents a difficult problem. There is a little more readiness to take nourishment, and the local condition is progressing. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

8.30 P.M. The King has had a good day. There is no change in the conditions noted this morning. Bacteriological examination shows that the extent and potency of the local infection are diminishing. (Signed also by Dr. L. E. H. Whitby.)

TUESDAY, JAN. 1ST, 1929. 11.15 A.M.

The King has had a good night. The general and local conditions are unchanged.

8.15 P.M. The King has had a restful day and there is a slight improvement in the general condition. Administration of calcium, based on chemical examination of the blood, is producing beneficial results. (Signed also by Prof. Edward Charles Dodds.)

WEDNESDAY, JAN. 2ND. 11.15 A.M.

In spite of a restless night the condition of His Majesty remains unchanged from last evening.

8.15 P.M. The King has passed a good day and there is a slight improvement in his condition

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.